

JOHN SZINGER

AIR AND SPACE ORIGAMI



TUTTLE

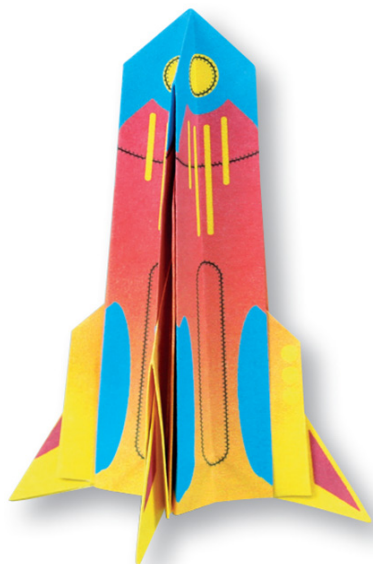
AIR AND SPACE **ORIGAMI**

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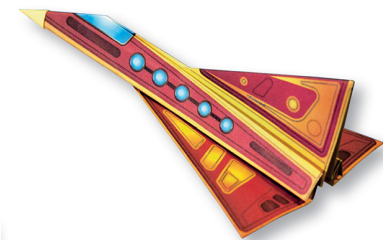
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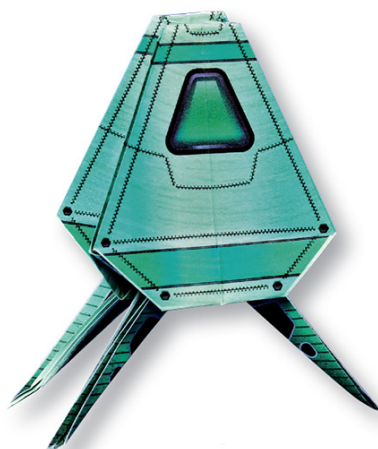
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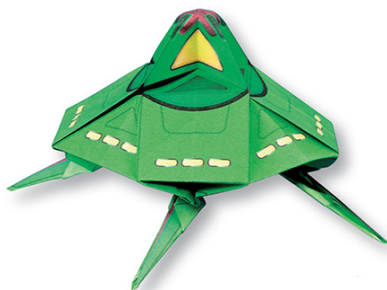
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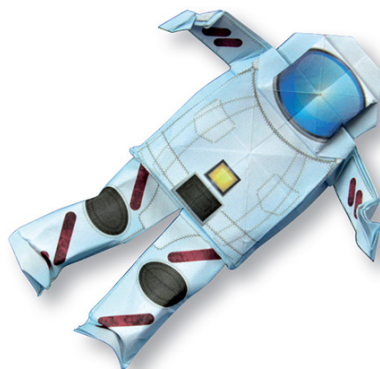
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THE ADVENTURE OF FLIGHT

Since ancient times, people have looked up to the sky and dreamed of flying through the air and traveling among the stars. The ancients imagined the sun as a chariot, the moon as a wolf, and the sky as being imbued with magic powers. But all of it remained essentially unreachable and mysterious.

It is only in our modern age of technological marvels that dreams of flight have been made possible. The era of powered human air travel began little more than one hundred years ago with the invention of the airplane. Space exploration became a reality just a half century later. We now have a much more sophisticated understanding of the sky and outer space. The potential for exploration seems limitless.

Many scientists believe we may eventually make contact with intelligent beings and civilizations from other planets. Of course, nothing is guaranteed. Thousands of years ago advanced civilizations existed around the Mediterranean Sea and in other places on Earth, only to crumble into ruins. It took many centuries for humans to rediscover and eventually surpass the levels of knowledge possessed by the ancients. So it is in modern times. Technological progress must be matched by wisdom and compassion.

In addition to pilots, astronauts, and other pioneers, the great adventure of sky and outer space exploration could not be accomplished without the scientists, engineers, designers, craftsmen, managers, researchers and workers of all kinds who dream up and bring into existence the vehicles that push the boundaries of speed and distance. I hope that in folding the models in this book you share in some small way that sense of adventure.



The Museum of Flight in Seattle, WA is the largest private air and space museum in the world. Elena_Suvorova/Shutterstock.com



The National Air and Space Museum in Washington, DC and Chantilly, VA holds the largest collection of historic aircraft and spacecraft in the world. f1photo/Shutterstock.com



A “rocket garden” at the Kennedy Space Center in Merritt Island, Florida. NeonLight/Shutterstock.com

This book presents a collection of origami aircraft and

spaceships based in part on historical examples, combined with speculation about future possibilities, maybe another hundred years from now. Most scientists think that Mars is devoid of advanced life forms, but there's no reason the red planet might not become home to visitors from another world much farther away, who have colonized it in order to be closer to Earth.

The models in this book are generally of an intermediate level, accessible to the folder with some experience but not necessarily an expert. They are designed to be foldable from 8" paper. A collection of paper is provided with exciting graphics for each model. Feel free to experiment and fold these models out of other kinds of paper as well. Larger, smaller, thicker or thinner, plain or shiny will all give different and interesting results.

Note that traditional origami typically uses two-sided paper, one side white and the other of some color. If you are folding using the paper provided in this kit, the "colored side" is the side with the patterned graphics. It will be the outside on the finished model. The "white side" is the one with a solid color, and will be mostly hidden in the final model.

If you run into a step that seems unfamiliar or difficult, refer to the guide that follows. Fold neatly and precisely, particularly at the beginning of a model. Take your time and have fun!

Happy folding! — John Szinger

SYMBOLS AND FOLDS

The following is a handy reference to the symbols and folds described in the projects.

Lines



Valley fold



Mountain fold



Edge



Crease



Hidden fold, edge, or crease

Arrows



Fold



Pull out or unfold



Fold and unfold



Fold behind

More Arrows



Push in, sink or squash



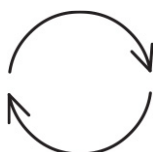
Pleat or crimp



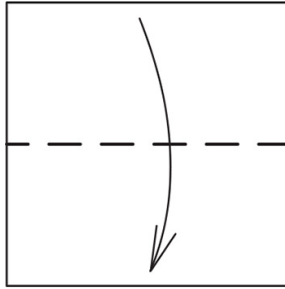
Turn over



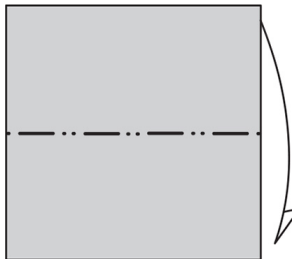
Repeat



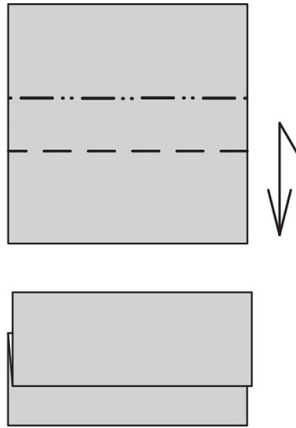
Rotate



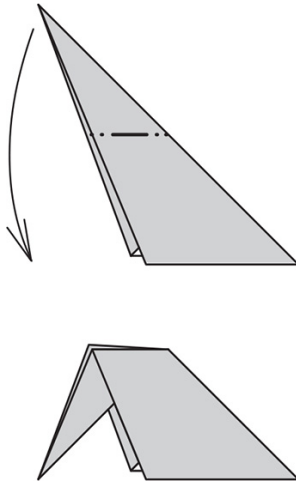
Valley Fold: Fold a layer of paper towards you. The result resembles a valley.



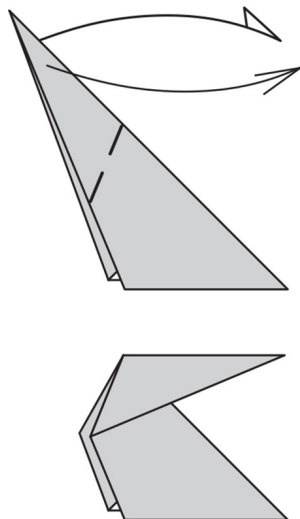
Mountain Fold: Fold a layer of paper behind the model. The result resembles a mountain.



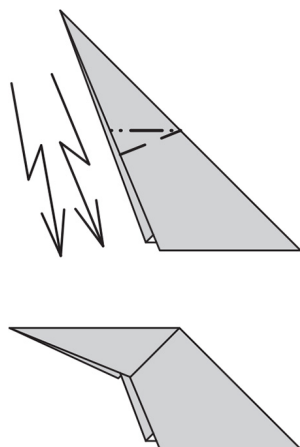
Pleat: Fold a valley fold and mountain fold. Symbols and Folds 7



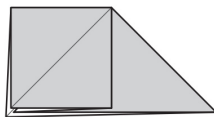
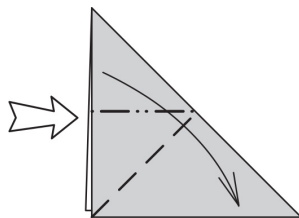
Reverse Fold (Inside Reverse Fold): Fold a flap of paper in between some layers.



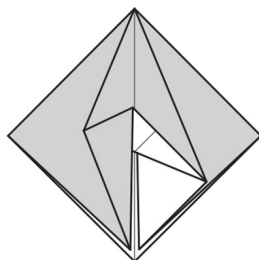
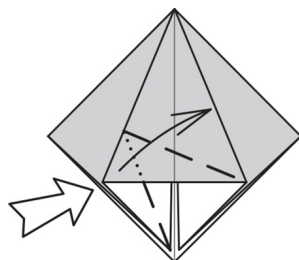
Outside Reverse Fold: Fold a flap of paper outside and around some layers.



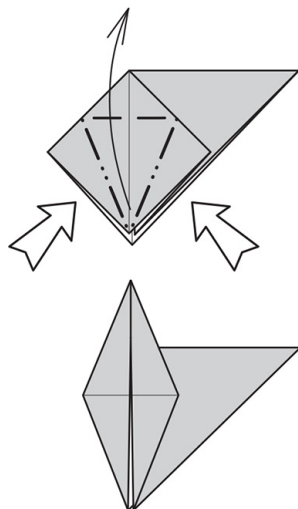
Crimp: A combination of two reverse folds.



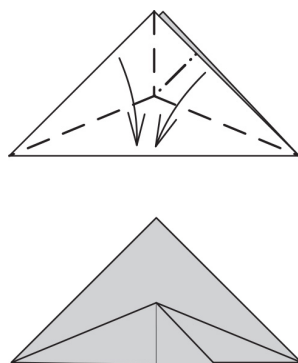
Squash Fold: Open up a flap of paper and squash it flat.



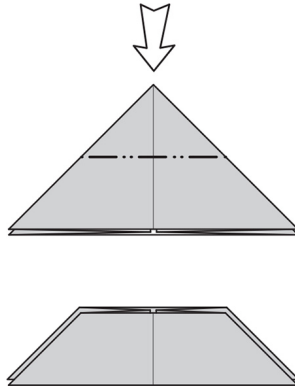
Swivel Fold: Slide a layer of paper and flatten.



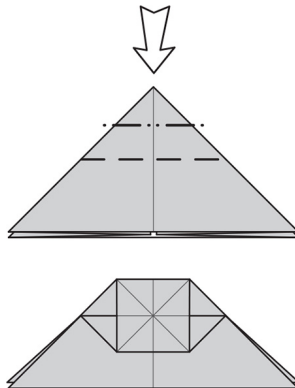
Petal Fold: Open out a point and flatten so two opposite sides meet.



Rabbit Ear: Flatten a corner so all edges lie on the same line.



Sink (Open Sink): Reverse a point on the inside of the paper. Much of the model may need to be unfolded to do this.

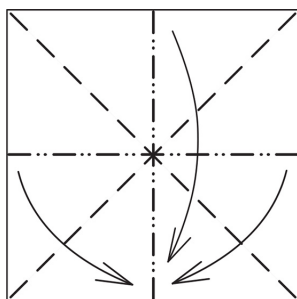
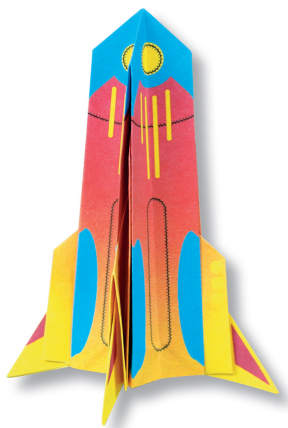


Spread Squash: Open a point on the inside of the paper and flatten.

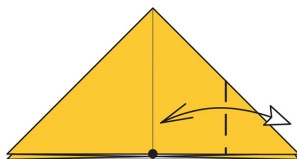
ART DECO ROCKET

This multi-stage rocket has a classic appearance. It was designed for heavy lifting of cargo and passengers into Earth orbit and was widely used in the first century of human space exploration and colonization.

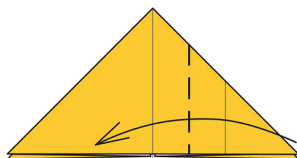
Use an 8" square or larger. Begin white side up.



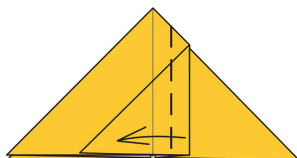
1. Waterbomb base.



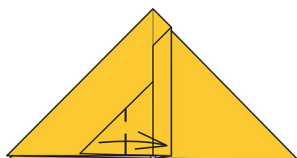
2. Fold and unfold.



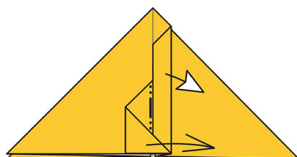
3. Valley fold.



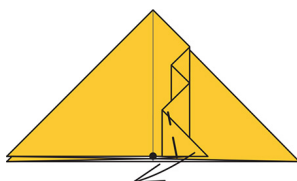
4. Valley fold.



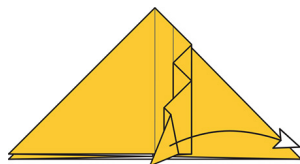
5. Valley fold.



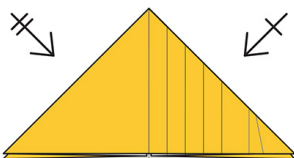
6. Unfold the flap to the right and slide the near layers.



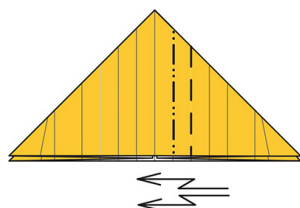
7. Valley fold so the edge touches the indicated point.



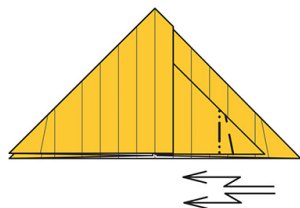
8. Unfold the entire flap.



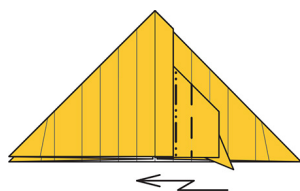
9. Repeat steps 2–8 on the other three flaps.



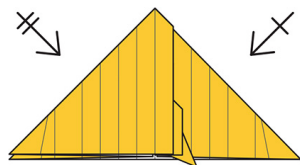
10. Reverse fold in and out.



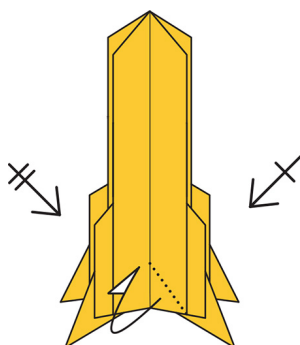
11. Reverse fold in and out again.



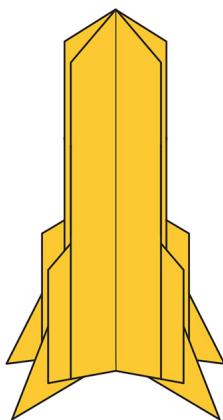
12. Mountain and valley fold in and out.



13. Repeat steps 10–12 on the other three flaps. Spread the four main flaps apart to make the model three-dimensional.



14. Fold a cluster of hidden layers to lock the fin. Repeat on the other three flaps.

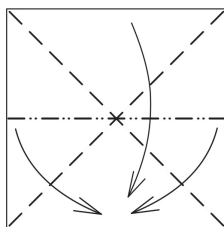


15. The Art Deco Rocket.

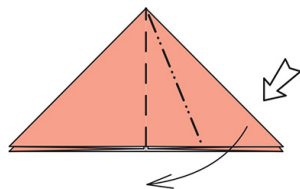
RETRO ROCKET

Originally designed for deep space exploration and long-distance transport, this sleek spacecraft was widely used by humans even beyond the Martian encounters of the twenty-second century.

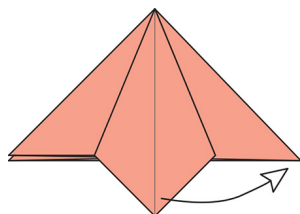
Use a 6" square or larger. Begin white side up.



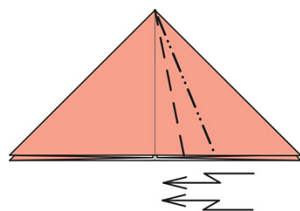
1. Fold in half while reverse folding the sides.



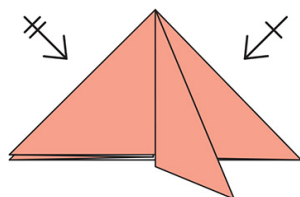
2. Squash fold.



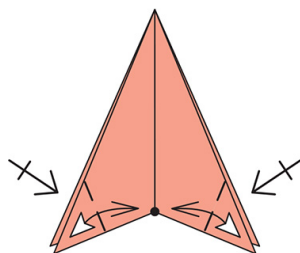
3. Unfold.



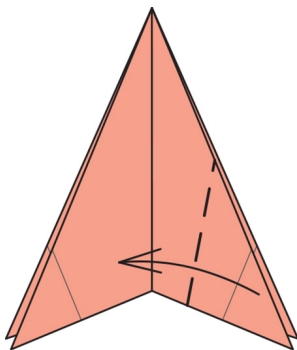
4. Crimp (reverse fold in and out).



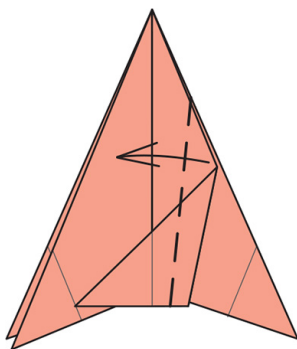
5. Repeat steps 2–4 on the other three flaps.



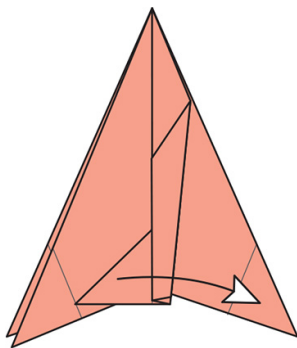
6. Fold the tips to the center and unfold.



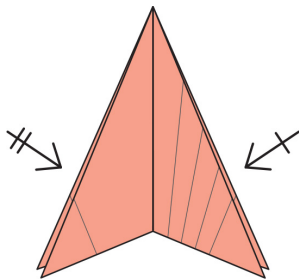
7. Fold the flap to the left so that the crease lies on the centerline.



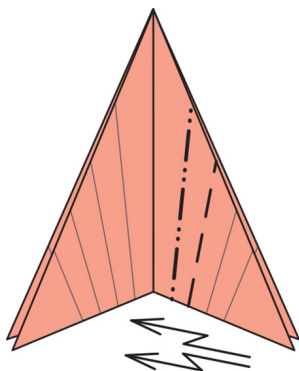
8. Fold the flap again so that the edge lies on the centerline.



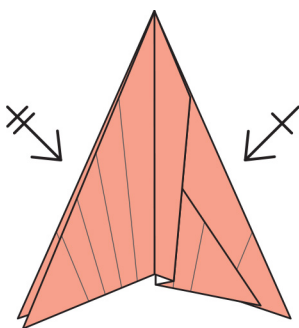
9. Unfold.



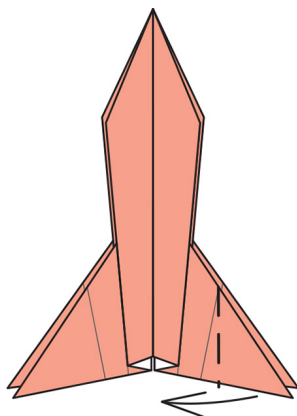
10. Repeat steps 6–9 on the other three flaps.



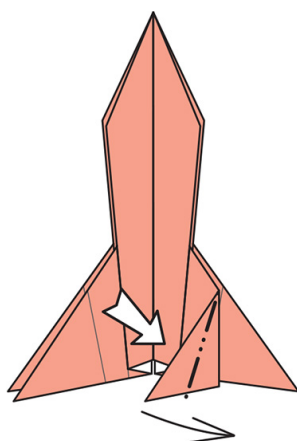
11. Crimp (reverse fold in and out).



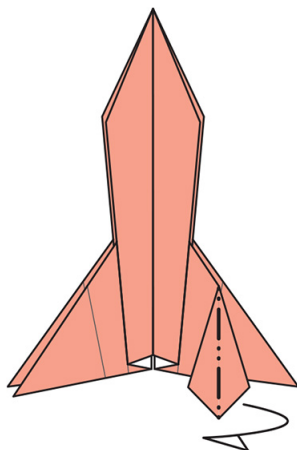
12. Repeat step 11 on the other three flaps.



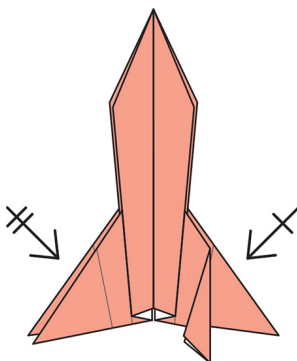
13. Fold a tail fin to the left.



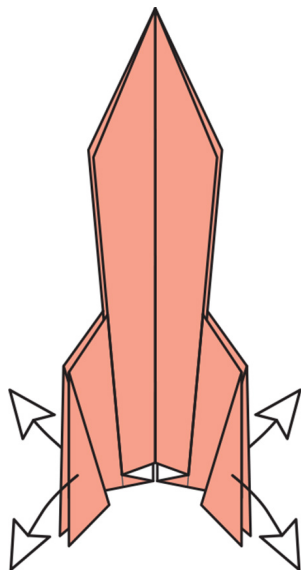
14. Squash fold.



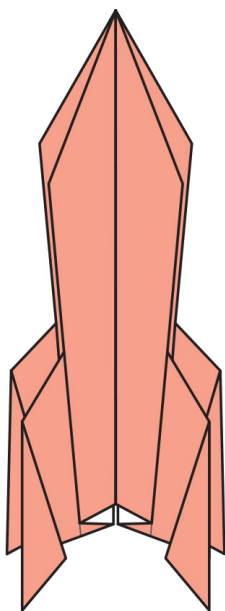
15. Fold the flap behind.



16. Repeat steps 13–15 on the other three flaps.



17. Spread the four main flaps apart to make the model three-dimensional.

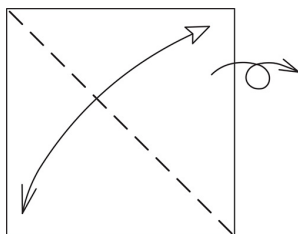
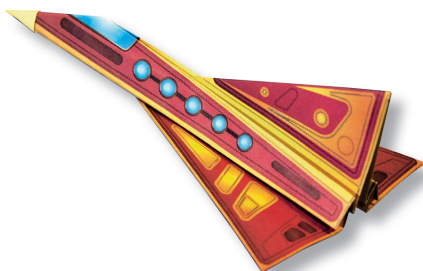


18. The Retro Rocket.

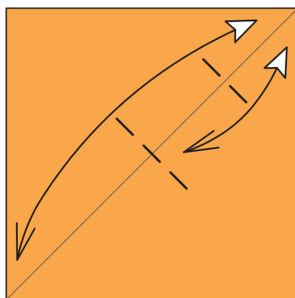
SPACE PLANE

Also known as the Rocket Plane, this craft is capable of reaching Earth orbit and returning to land like a regular airplane. It was popular with passengers as the quickest, most convenient way up to Earth's many space stations.

Use a 6" square or larger. Begin white side up, with the nose pointing up and left on the patterned side.

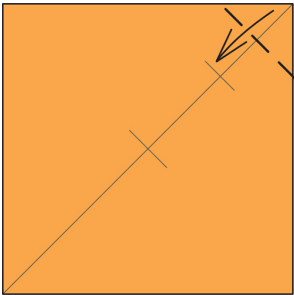


1. Fold and unfold on the diagonal. Turn the model over.

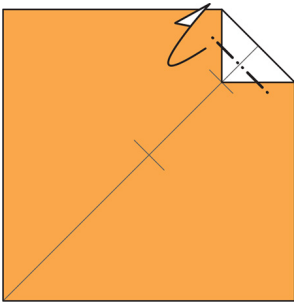


2. Fold the diagonal and crease the middle. Fold the corner to the

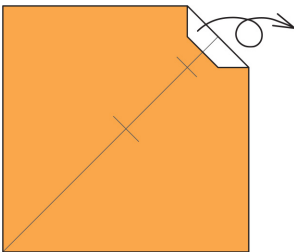
center and make a mark.



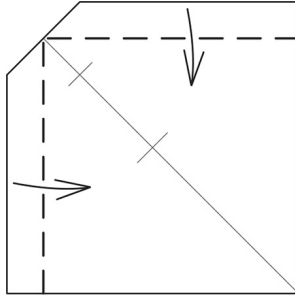
3. Fold the corner to the mark.



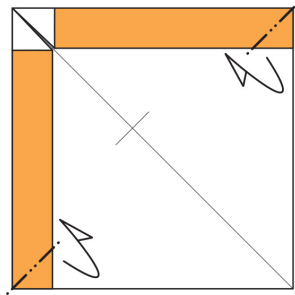
4. Tuck the corner underneath.



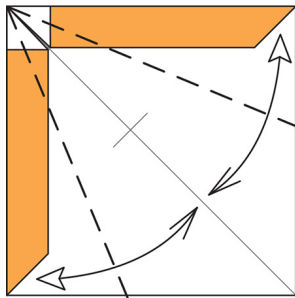
5. Turn the model over.



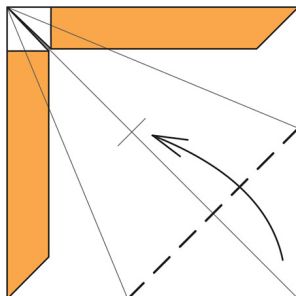
6. Fold in two sides parallel to the edges.



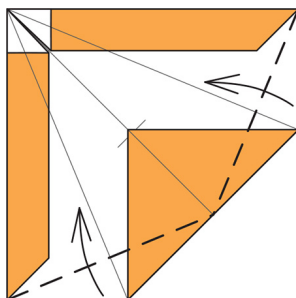
7. Tuck the corner flaps underneath.



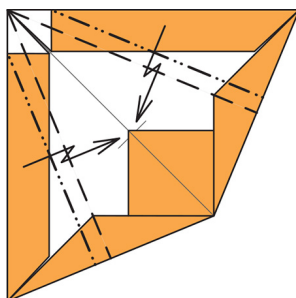
8. Fold to the center and unfold.



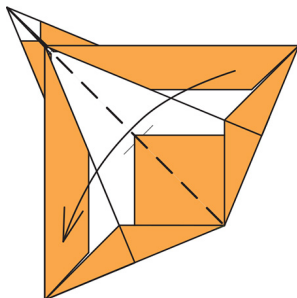
9. Fold the corner in.



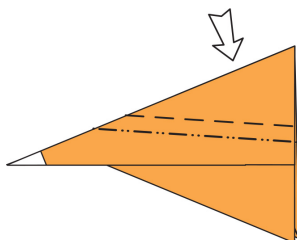
10. Fold the flaps in.



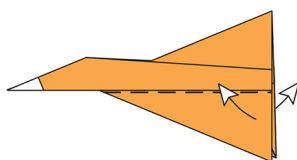
11. Pleat to form the wings.



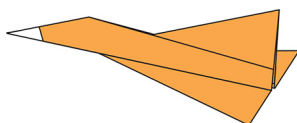
12. Fold the model in half.



13. Reverse fold in and out to form the tail fin.



14. Spread the wings.

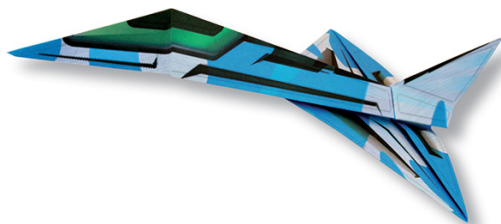


15. The Space Plane.

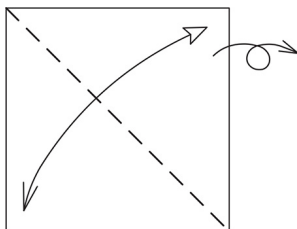
SPY PLANE

This plane was designed to fly long distances at great speeds and altitudes, going high into the upper atmosphere to the very edge of space. It was ideal for reconnaissance missions and scientific experiments.

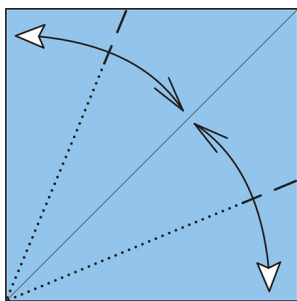
Use a 6" square or larger. Begin white side up, with the nose pointing up and left on the patterned side.



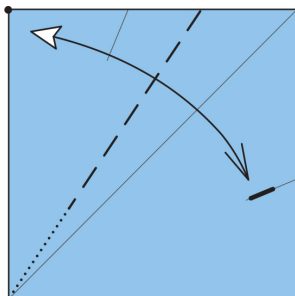
Spy Plane



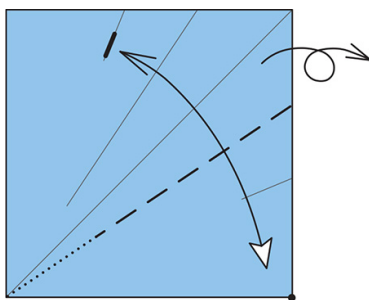
1. Fold and unfold on the diagonal. Turn the model over.



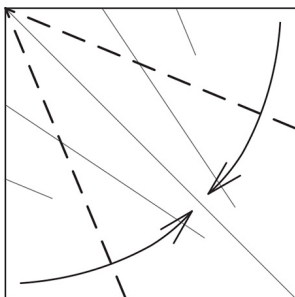
2. Fold to the center and unfold, creasing only at the edges.



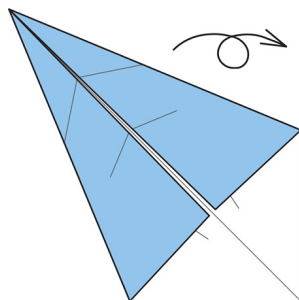
3. Fold the corner to the mark and unfold, creasing more than halfway in from the edge.



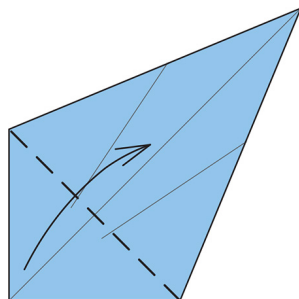
4. Repeat step 3 on the opposite side. Turn the model over.



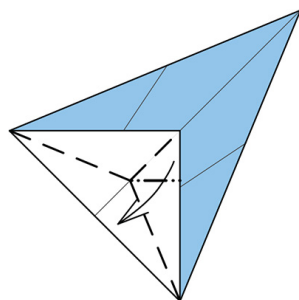
5. Fold the sides to the center.



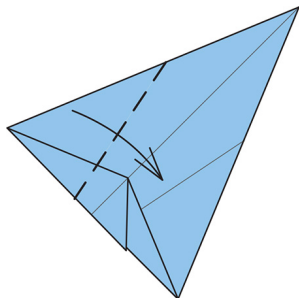
6. Turn the model over.



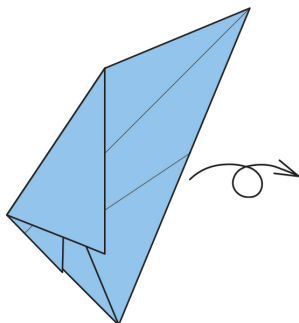
7. Valley fold the flap.



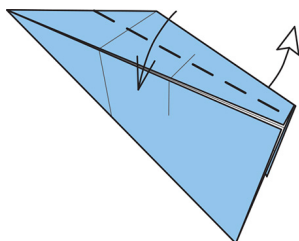
8. Rabbit ear.



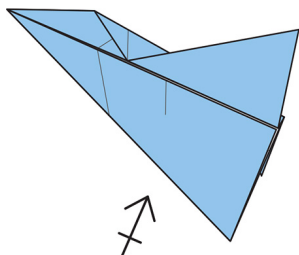
9. Fold on an existing crease.



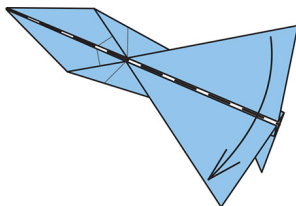
10. Turn the model over.



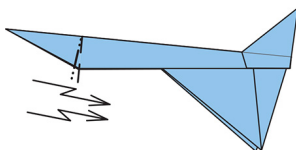
11. Fold the folded edge to the centerline. The wing flips out.



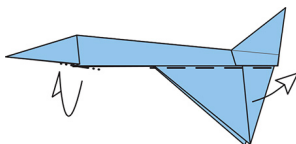
12. Repeat steps 9–11 on the other side.



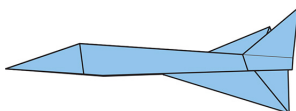
13. Fold the model in half.



14. Crimp the nose.



15. Tuck a layer inside. Repeat behind. Spread the wings.

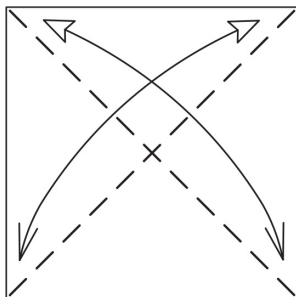


16. The Spy Plane.

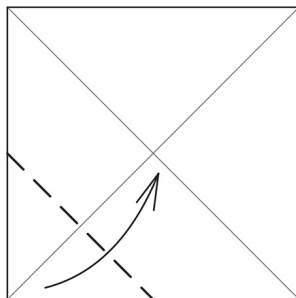
JUMBO JET

Long before civilian spaceflight became common, people crisscrossed the globe in commercial aircraft. The invention of the passenger jet reduced an intercontinental journey from a perilous month-long sea voyage to a relatively comfortable jaunt of just a few hours.

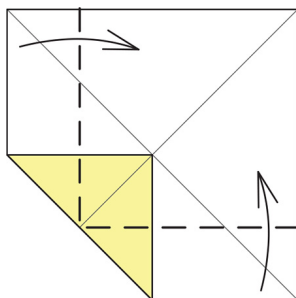
Use a 6" square or larger. Begin white side up, with the nose pointing down and left on the patterned side.



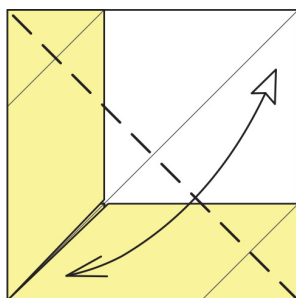
1. Fold and unfold on the diagonals.



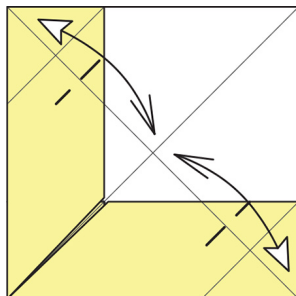
2. Fold the corner to the center.



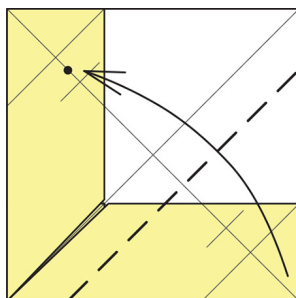
3. Fold two edges to the middle.



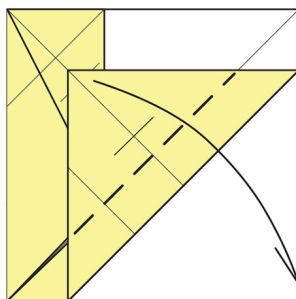
4. Fold and unfold.



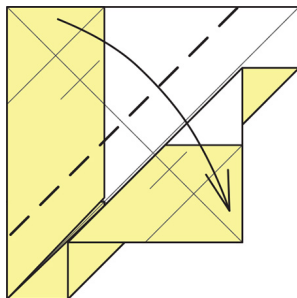
5. Fold two corners to the center and unfold.



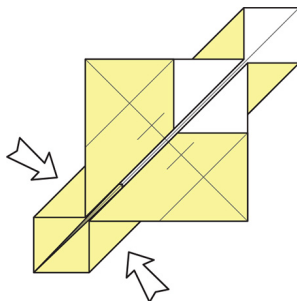
6. Fold the corner to a point halfway between two marks.



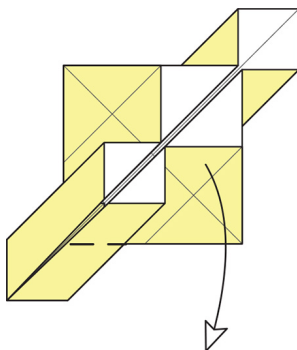
7. Fold out just past the centerline.



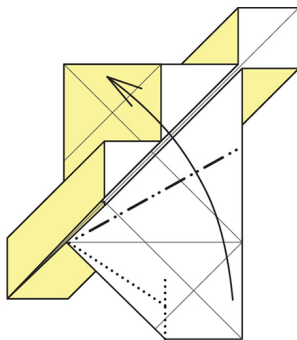
8. Repeat steps 6–7 on the opposite side.



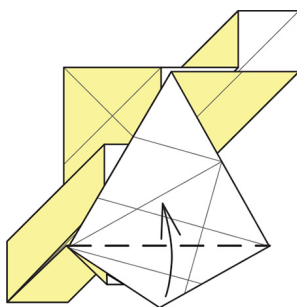
9. Rearrange the layers to make steps 6–7 as reverse folds.



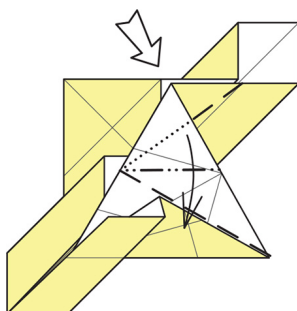
10. Fold the flap down.



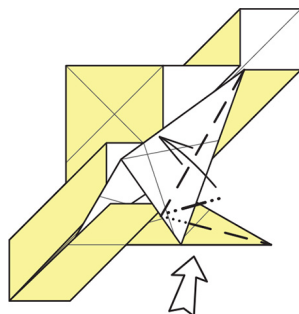
11. Swivel fold.



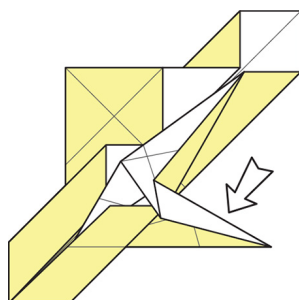
12. Fold the flap up.



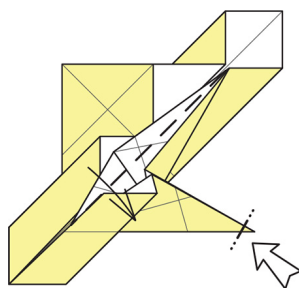
13. Squash fold.



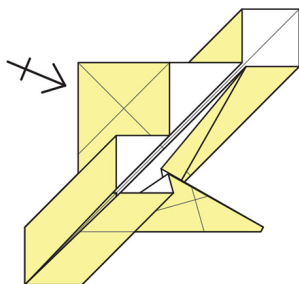
14. Squash fold.



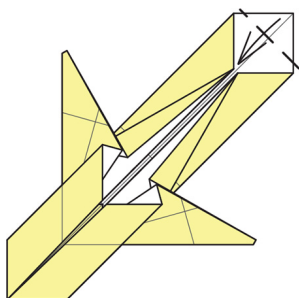
15. Tuck a layer underneath.



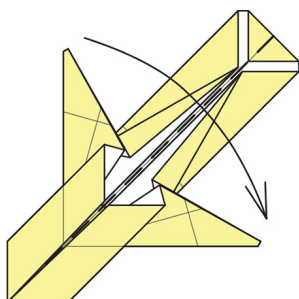
16. Tuck a layer underneath in the middle. Reverse fold the wingtip.



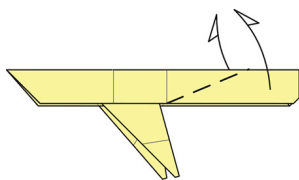
17. Repeat steps 10–16 on the opposite side.



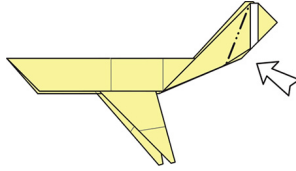
18. Valley fold at the tail.



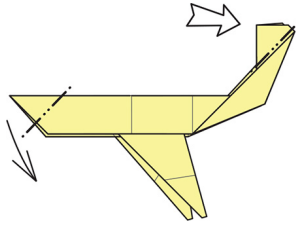
19. Fold the model in half.



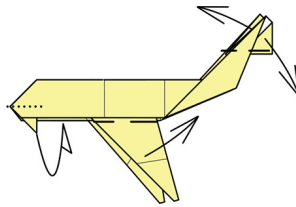
20. Outside reverse fold.



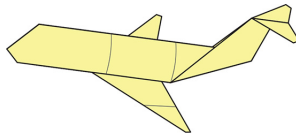
21. Reverse fold.



22. Reverse folds.



23. Tuck in the flap to lock the nose. Spread the wings and tail.

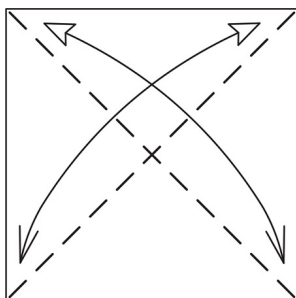


24. The Jumbo Jet.

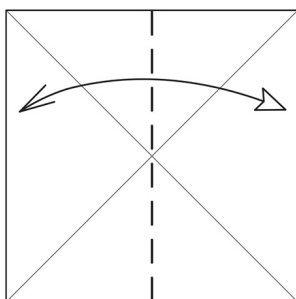
FLYING WING

Flying wings have been flown since the early twentieth century. This unique aircraft design allows for greater speed and maneuverability as well as greater interior space.

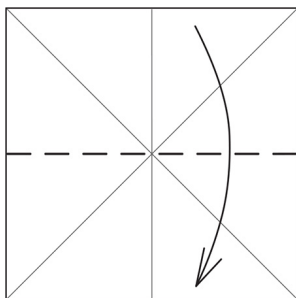
Use a 6" square or larger. Begin white side up, with the windows pointing toward the bottom on the patterned side.



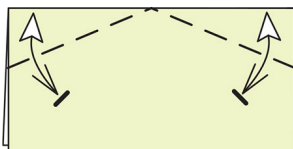
1. Fold and unfold on the diagonals.



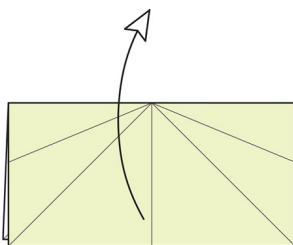
2. Fold and unfold.



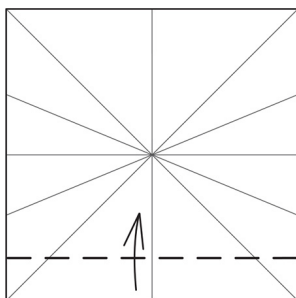
3. Fold the top half down.



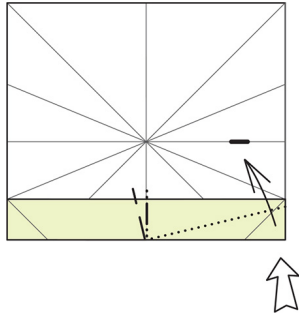
4. Fold and unfold.



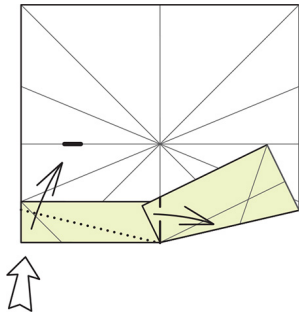
5. Unfold.



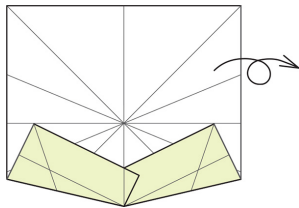
6. Fold the bottom edge up.



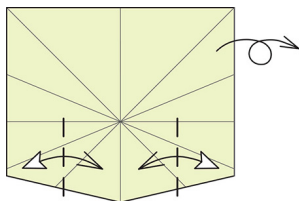
7. Swivel fold so the corner is on the crease.



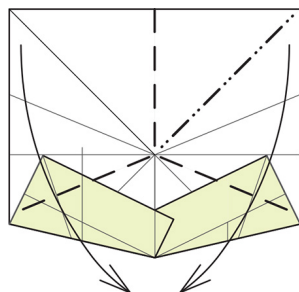
8. Repeat step 7 on the left.



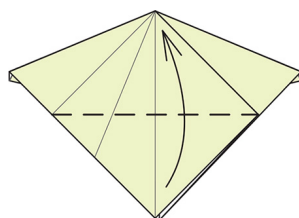
9. Turn the model over.



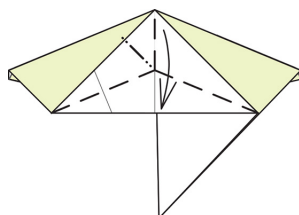
10. Fold and unfold. Turn the model over.



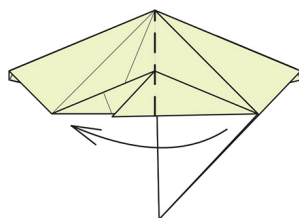
11. Rabbit ear.



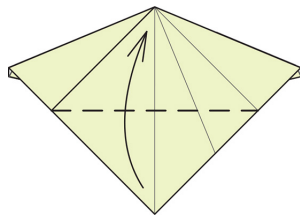
12. Fold the flap up.



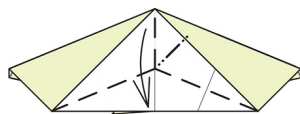
13. Rabbit ear.



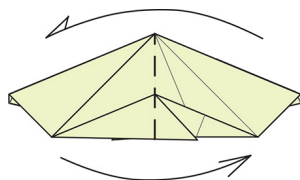
14. Swing the flap to the left.



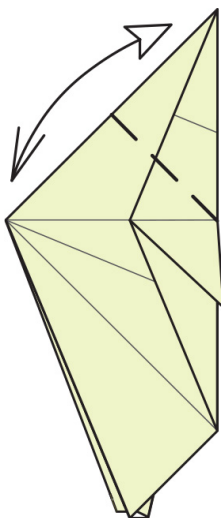
15. Fold the flap up.



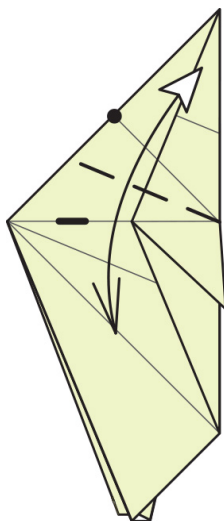
16. Rabbit ear.



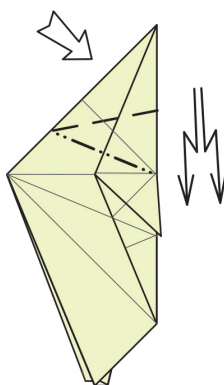
17. Fold the near flap to the right; fold the flap underneath to the left.



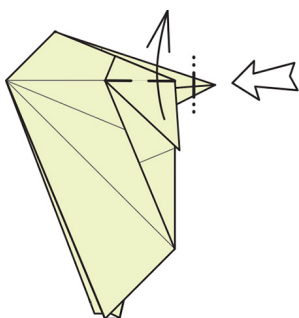
18. Model is rotated. Fold and unfold.



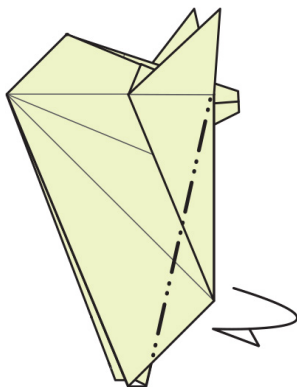
19. Fold and unfold.



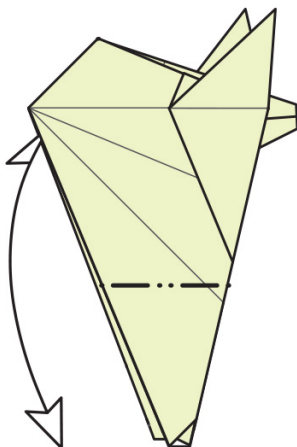
20. Crimp.



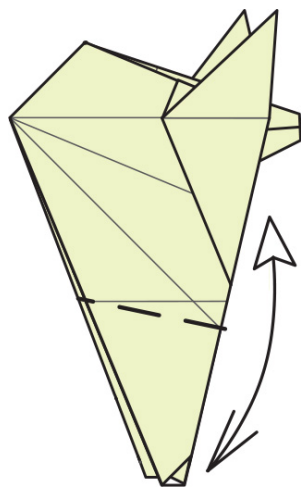
21. Fold a flap up. Repeat behind. Reverse fold the tip at the tail.



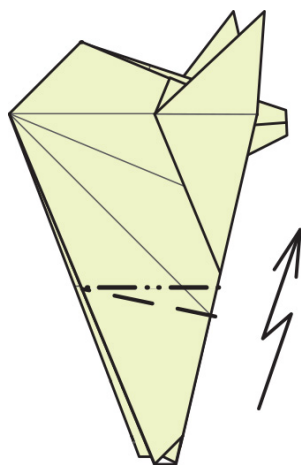
22. Tuck the back of the wing inside. Repeat behind.



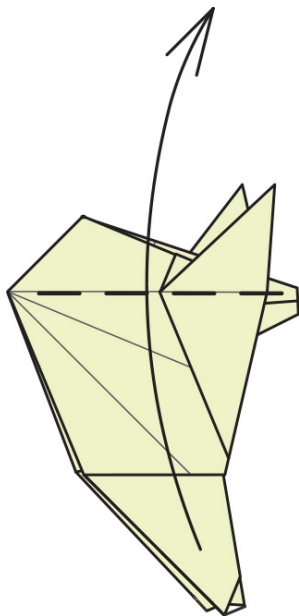
23. Fold underneath on an existing crease and unfold. Repeat behind.



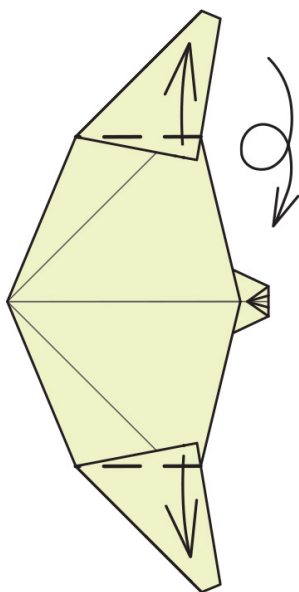
24. Fold and unfold. Repeat behind.



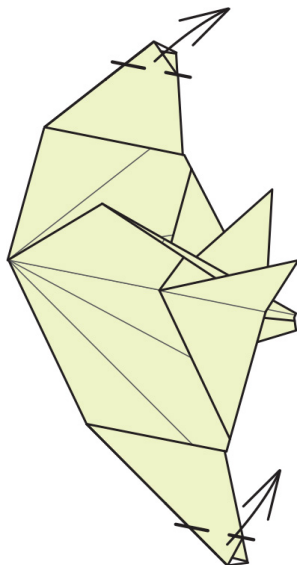
25. Pleat the wing. Repeat behind.



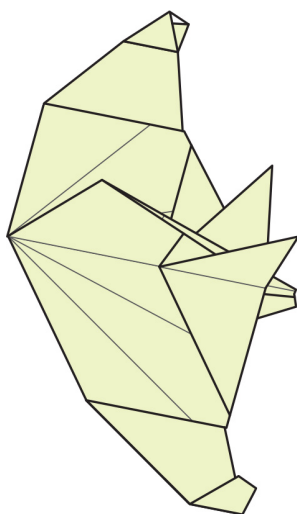
26. Fold the wing upward.



27. Separate and fold the near layer out from the model. Turn the model over top to bottom.



28. Fold the wing tips up.

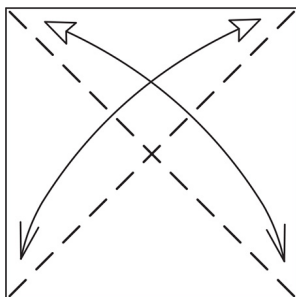


29. The Flying Wing.

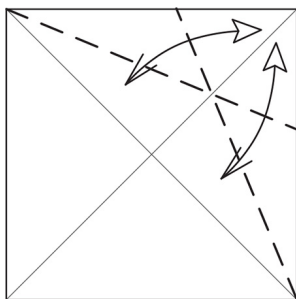
SUPERSONIC TRANSPORT

SSTs are extremely fast passenger jets that break the sound barrier (767 mph / 1,234 km/h) to fly from London to New York in two and a half hours.

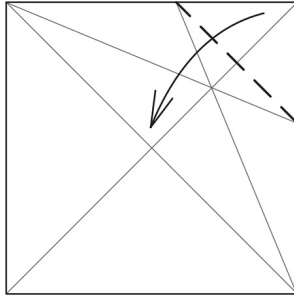
Use an 8" square or larger. Begin white side up, with the nose pointing down and left on the patterned side.



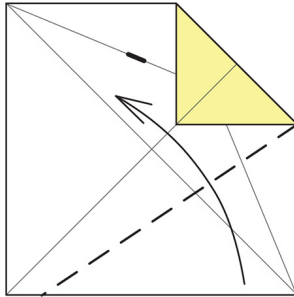
1. Fold and unfold on the diagonals.



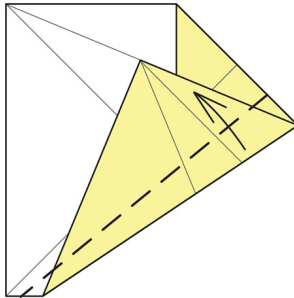
2. Fold and unfold.



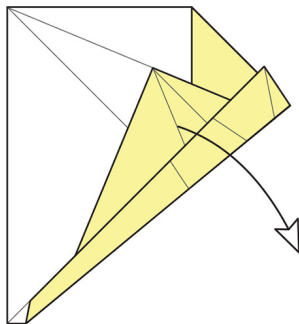
3. Fold the corner inward.



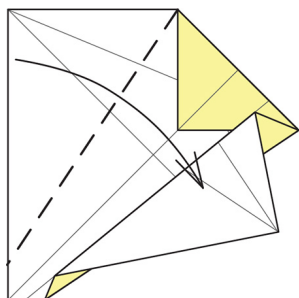
4. Fold so the corner lies on the indicated crease.



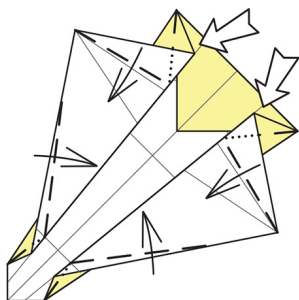
5. Fold the edge to the centerline.



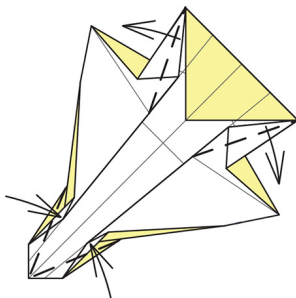
6. Unfold partway.



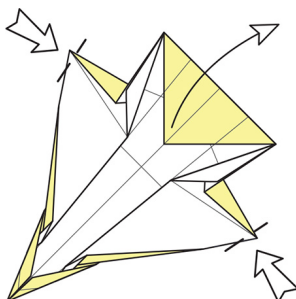
7. Repeat steps 4–6 on the other side.



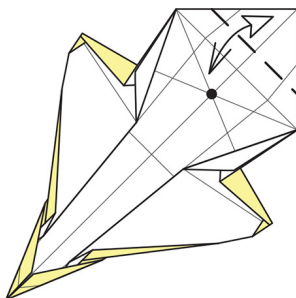
8. Swivel folds.



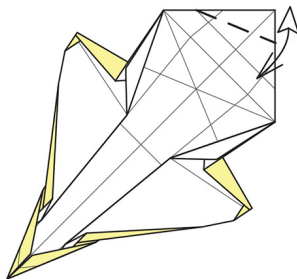
9. Valley folds.



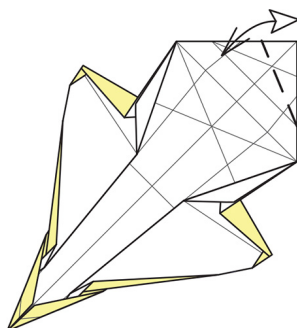
10. Reverse fold the wingtips. Unfold the flap at the tail.



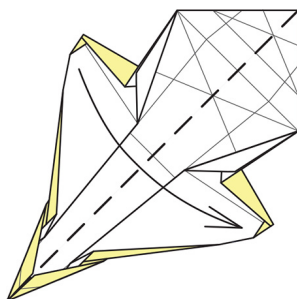
11. Fold and unfold.



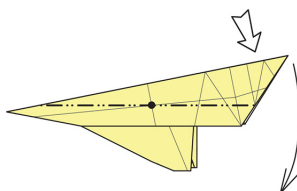
12. Fold and unfold.



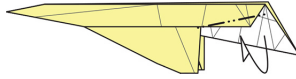
13. Fold and unfold.



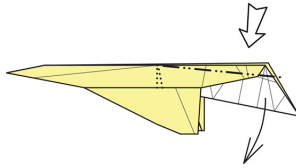
14. Fold the model in half.



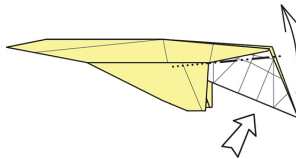
15. Reverse fold through the land-mark parallel to the lower edge.



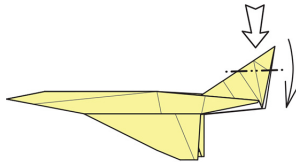
16. Tuck in a flap. Repeat behind.



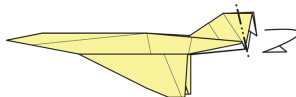
17. Slide the tail down and flatten.



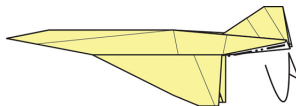
18. Reverse fold the tail back up.



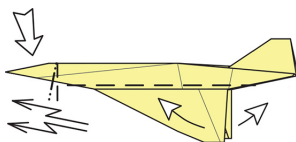
19. Reverse fold the tip of the tail in.



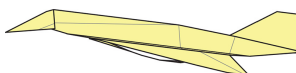
20. Tuck the layers of the tail inside.



21. Tuck the two flaps in together to lock the back of the model.



22. Spread the wings. Crimp the nose.



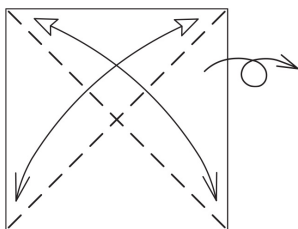
23. The Supersonic Transport.

HOT AIR BALLOON

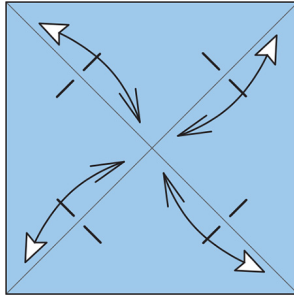
Over a century before heavier-than-air craft were invented, balloons let people ascend into the sky. Hot air balloons remain popular to this day.

An Easter egg dipper or cork cage makes a good stand. A marble in the gondola will help keep it stable in the stand.

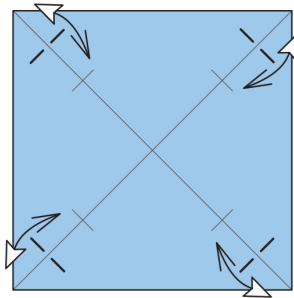
For best results, use a 10" square or larger. Paper that size was too large to include in this kit, but you may download the pattern seen in the photo and print it as large as you like. To download, type this URL into an Internet-connected web browser: www.tuttlepublishing.com/air-and-space-origamikit-downloadable-content. Begin white side up. Begin white side up.



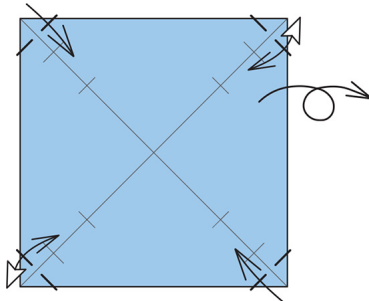
1. Fold and unfold on the diagonals. Turn the model over.



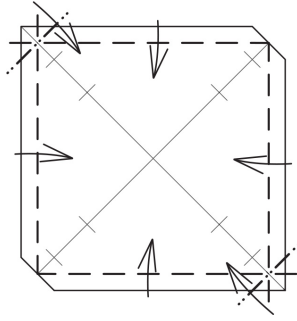
2. Fold each corner to the center, make a mark and unfold.



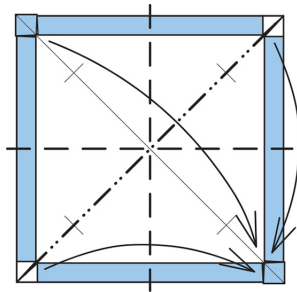
3. Fold each corner to the mark and make a second mark, then unfold.



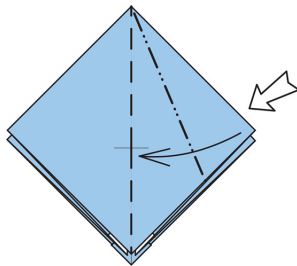
4. Valley fold the corners to the marks; unfold two. Turn the model over.



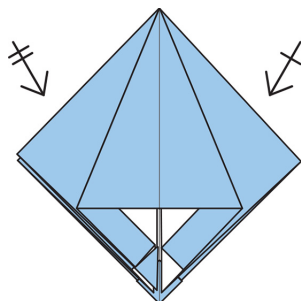
5. Fold the edges in, squash folding at two corners.



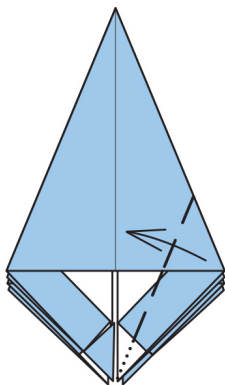
6. Bring the three corners to the lower right corner and rotate.



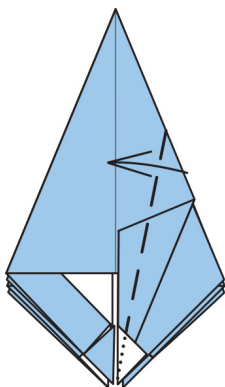
7. Squash fold.



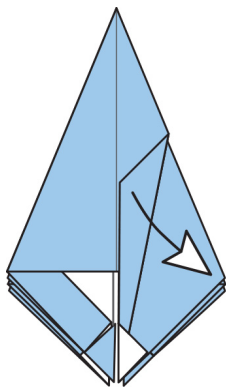
8. Repeat step 7 three times.



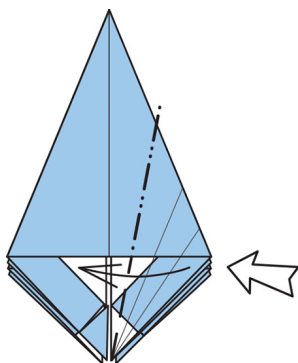
9. Valley fold a flap.



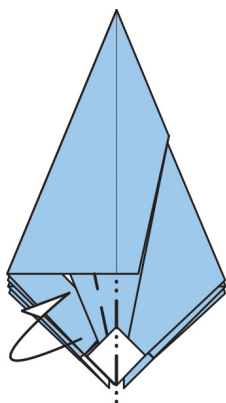
10. Valley fold again.



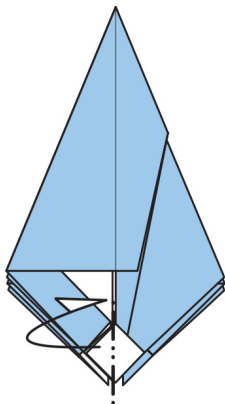
11. Unfold.



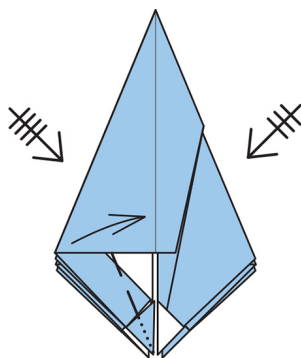
12. Reverse fold.



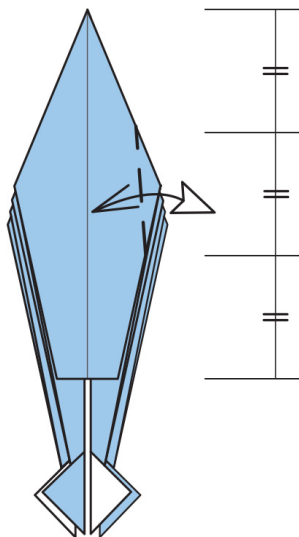
13. Pleat along existing creases.



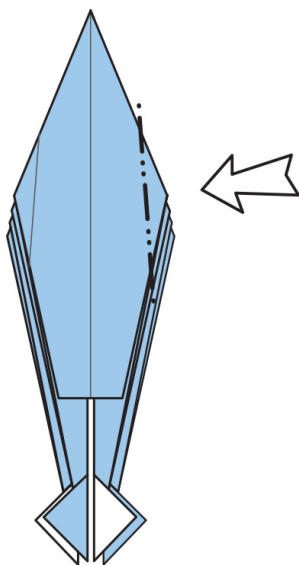
14. Fold the white flap behind.



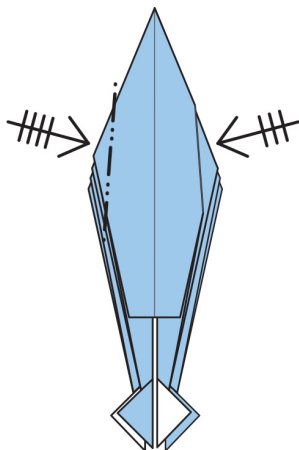
15. Repeat steps 9–14 on the remaining 7 flaps.



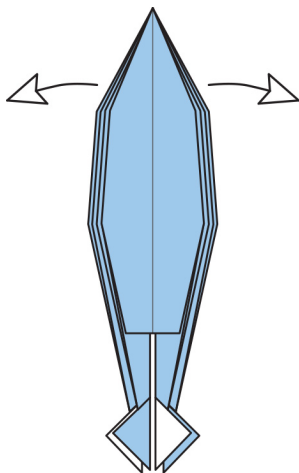
16. Fold and unfold, dividing into thirds.



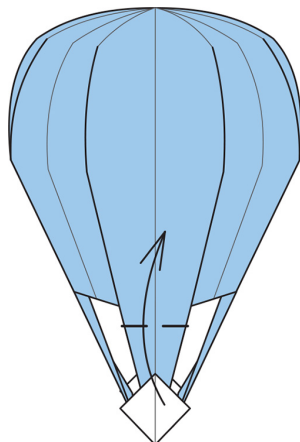
17. Closed sink.



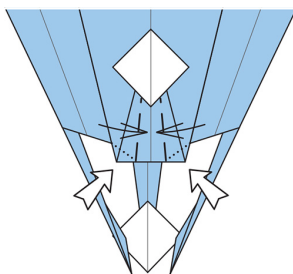
18. Repeat steps 17–18 seven times.



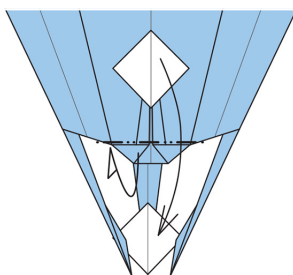
19. Open to make the model 3-D.



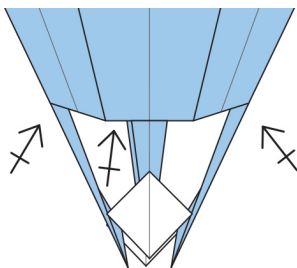
20. Fold a flap up; the crease is lower than the edge.



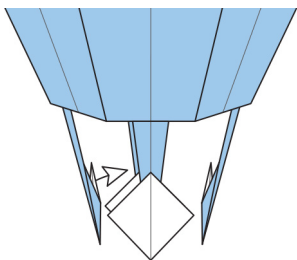
21. Squash folds to narrow the flap.



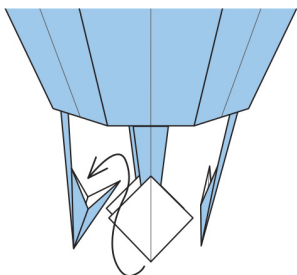
22. Fold the flap down; the lower part swings up inside.



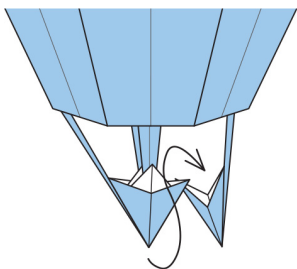
23. Repeat steps 20–22 three times.



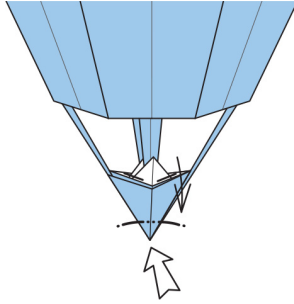
24. Open up the pocket on the left flap.



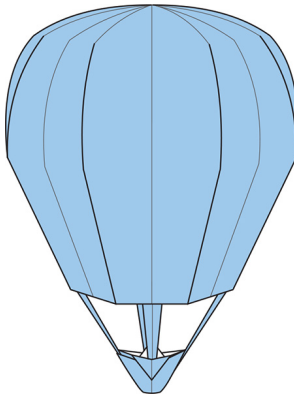
25. Fit the two white flaps into the left flap.



26. Slide the three flaps together into the right flap to form the basket.



27. Fold the corner down to lock the basket. Repeat behind. Flatten the bottom.

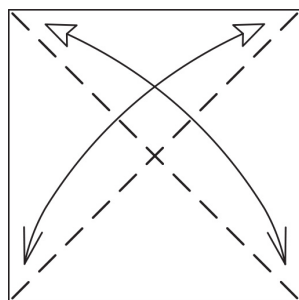


28. The Hot Air Balloon.

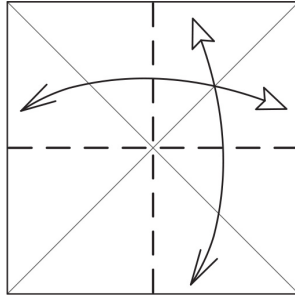
MARTIAN

In the year 2113, humans from Earth made first contact with beings from another planet. Although the meeting took place on Mars, these old and wise beings were originally from another planet much, much farther away. Nevertheless, the name “Martians” stuck.

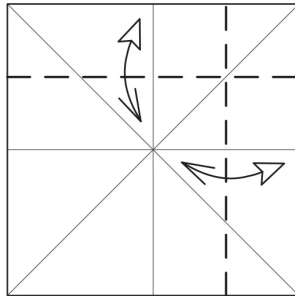
Use a 6” square or larger. Begin white side up, with the face at top right on the patterned side.



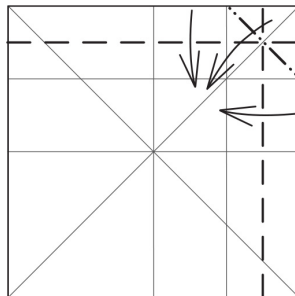
1. Fold and unfold on the diagonals.



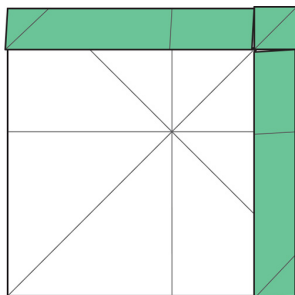
2. Fold and unfold on the square axes.



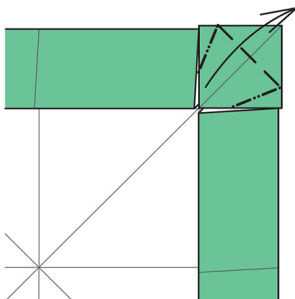
3. Fold two edges to the center and unfold.



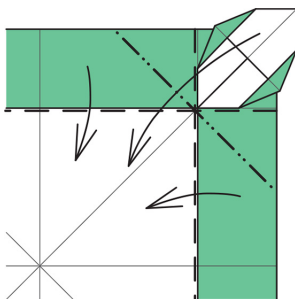
4. Fold in two edges and make a squash fold at the corner.



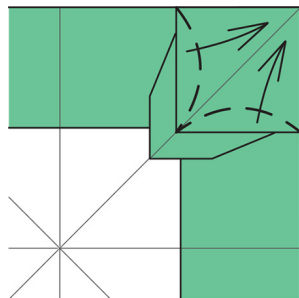
5. Like so.



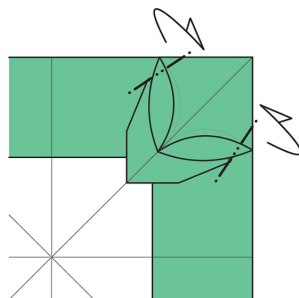
6. Petal fold.



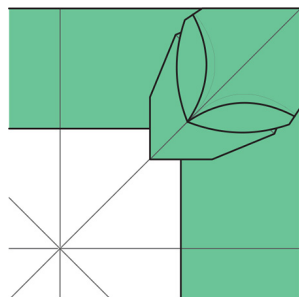
7. Fold the sides in while squashing at the corner.



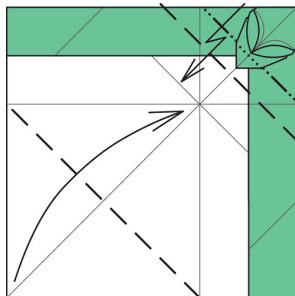
8. Open up to form eyes.



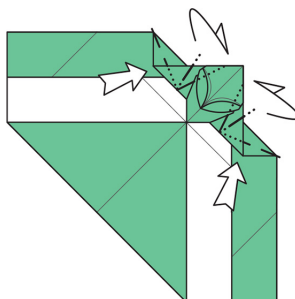
9. Fold the tips of the flaps behind.



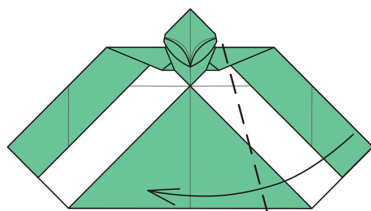
10. Like so.



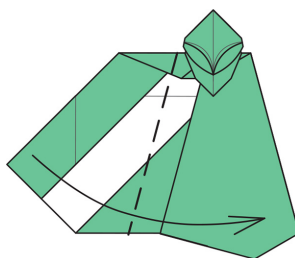
11. Pleat to form the neck. Fold the opposite corner up.



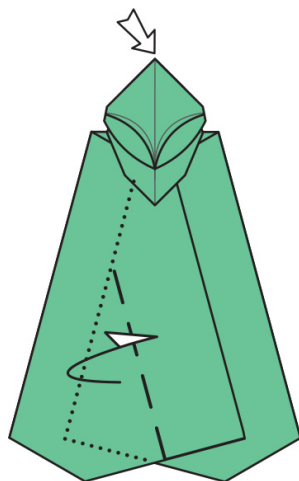
12. Swivel folds.



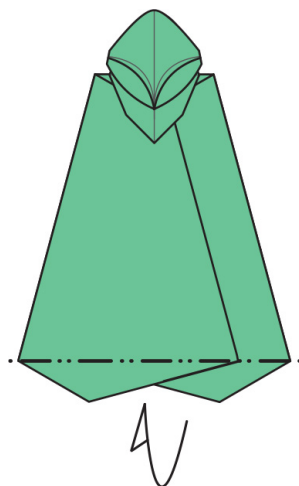
13. Fold a flap to the left.



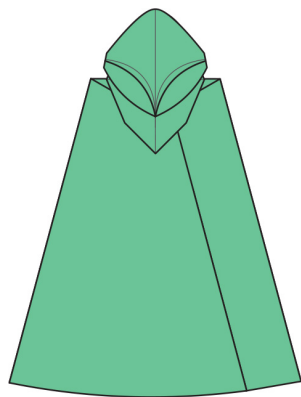
14. Fold a flap to the right so they overlap.



15. Push on the top of the head to round it. Fold a hidden flap to lock the layers together.



16. Tuck the layers at the bottom inside.

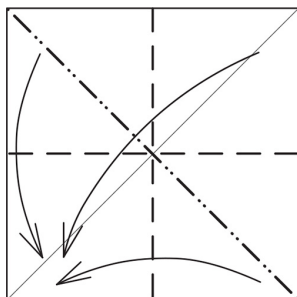
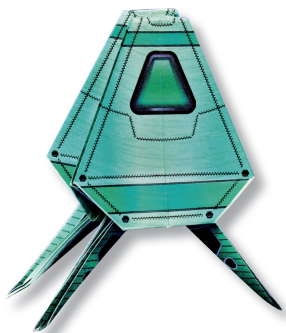


17. The Martian.

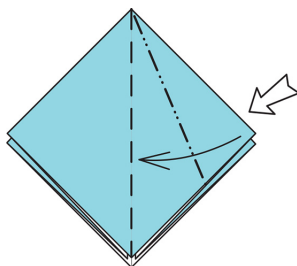
SPACE POD

According to some sources, the Martians have been using the Space Pod as an incognito transport to Earth for centuries, and have successfully infiltrated human society and remained largely undetected.

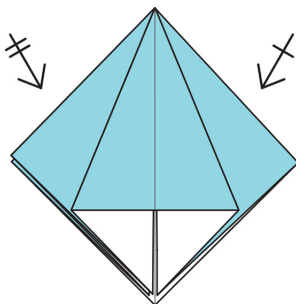
Use a 6" square or larger. Begin white side up.



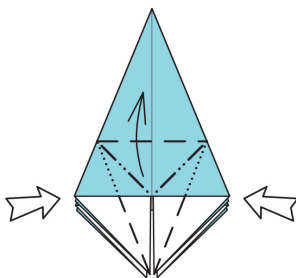
1. Bring the corners to the bottom left corner and rotate.



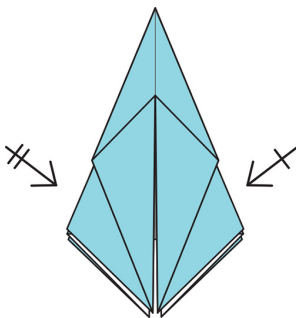
2. Squash fold.



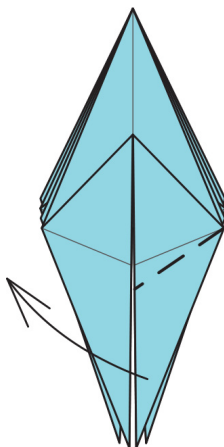
3. Repeat step 2 on the other three flaps.



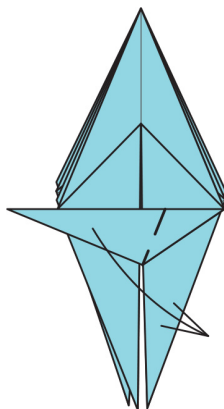
4. Petal fold.



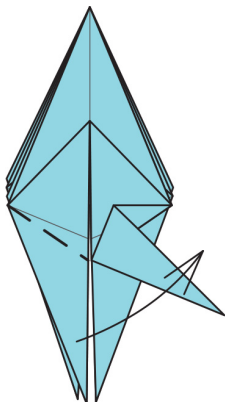
5. Repeat step 4 on the other three flaps.



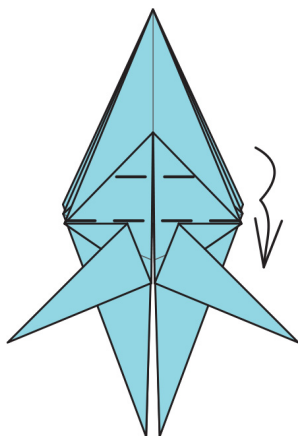
6. Fold a flap to the left.



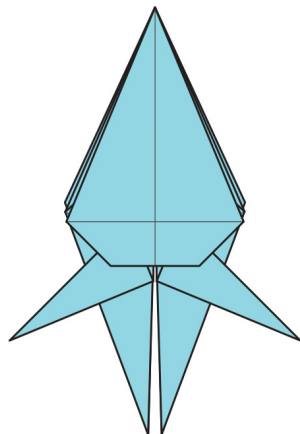
7. Fold the flap back down and to the right.



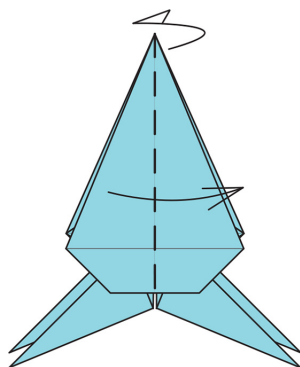
8. Repeat steps 6–7 on the left flap.



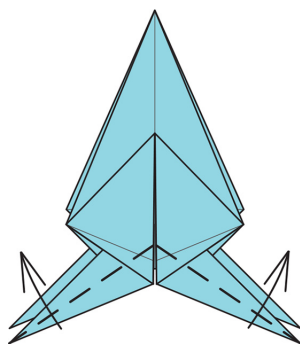
9. Fold the center flap down and down again.



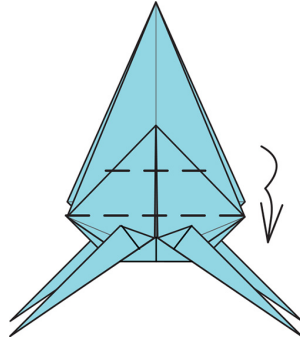
10. Repeat steps 6–9 on the back.



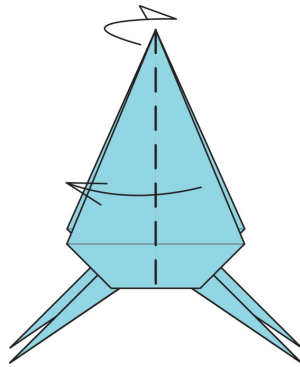
11. Swing a flap in front to the right, and a flap in back to the left.



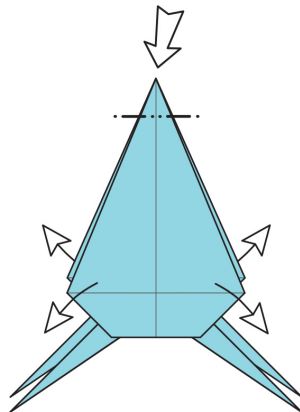
12. Narrow the legs. Repeat behind.



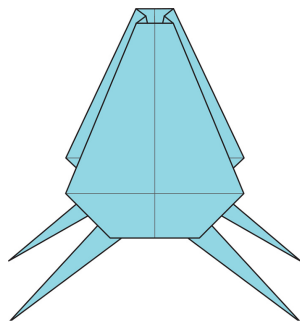
13. Fold the center flap down and down again.



14. Swing a flap in front to the left, and a flap in back to the right.



15. Puff out the model to make it 3-D. Sink the tip at the top.

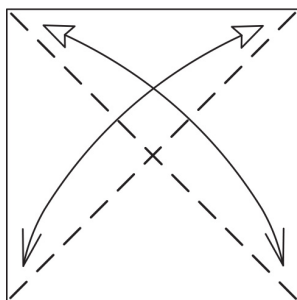
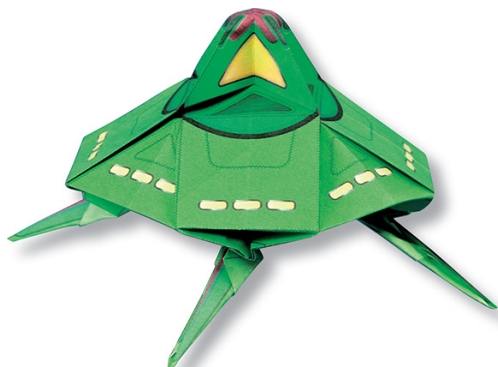


16. The Space Pod.

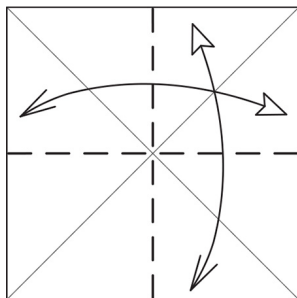
FLYING SAUCER

An advanced starship of Martian invention, this craft is suitable for long-distance interstellar voyages. It can warp space and time to travel faster than light.

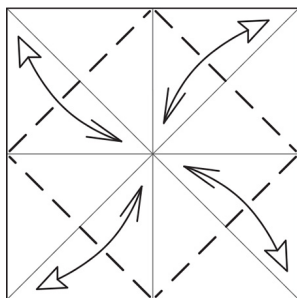
Use a 6" square or larger. Begin white side up.



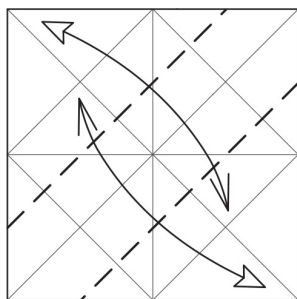
1. Fold and unfold on the diagonals.



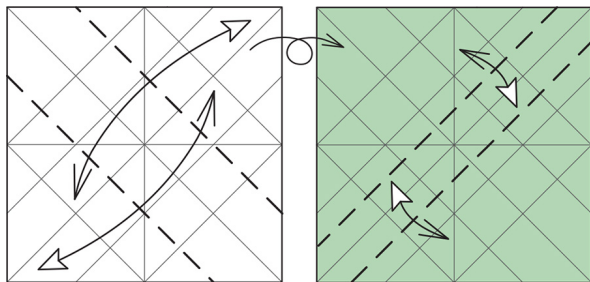
2. Fold and unfold on the square axes.



3. Fold to the center and unfold.

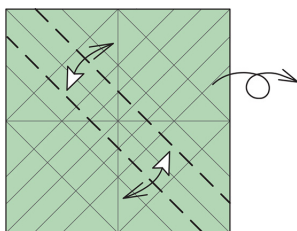


4. Fold and unfold.

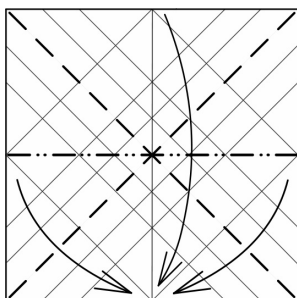


5. Fold and unfold. Turn the model over.

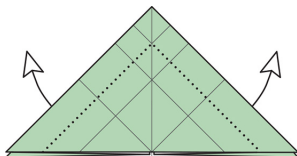
6. Fold and unfold.



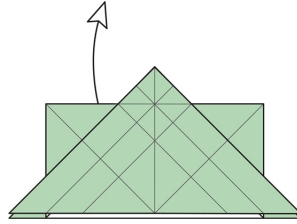
7. Fold and unfold. Turn the model over.



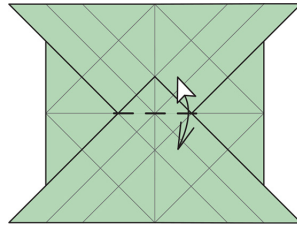
8. Fold in half while reverse folding the sides.



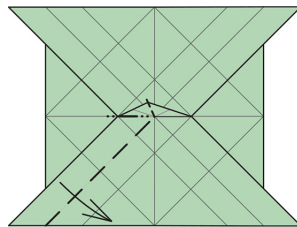
9. Reverse folds on hidden creases.



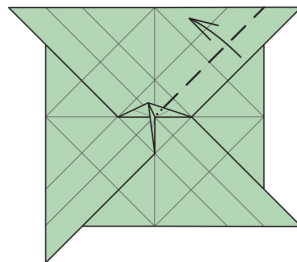
10. Fold the bottom flap up.



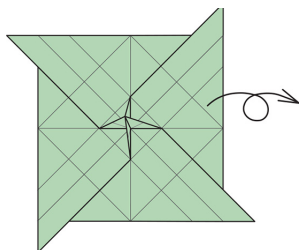
11. Fold the flap in the middle to stick straight up from the model.



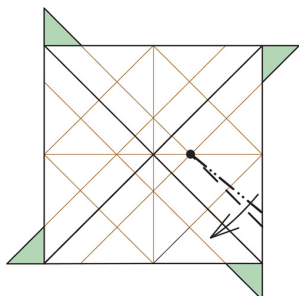
12. Reverse fold. The flap will stick up at the center.



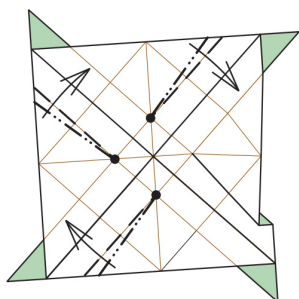
13. Repeat on the opposite flap.



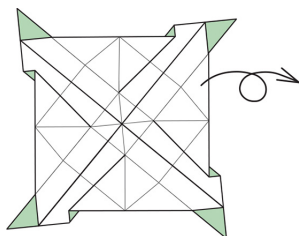
14. The center is like a pyramid. Turn the model over.



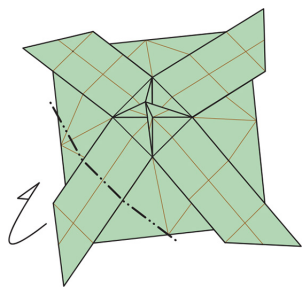
15. Crimp a wedge from the indicated point. The model becomes 3-D.



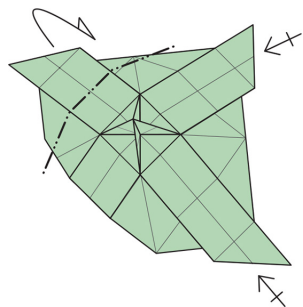
16. Repeat step 15 three more times.



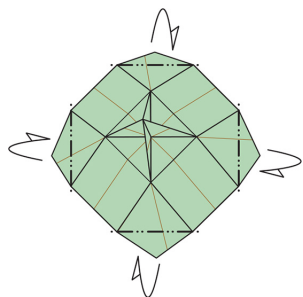
17. Turn the model over.



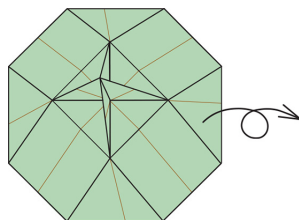
18. Fold a flap underneath. The model is not flat, but the fold is a straight line.



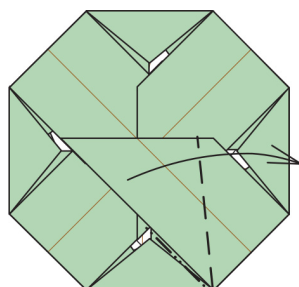
19. Repeat step 18 on the other three sides.



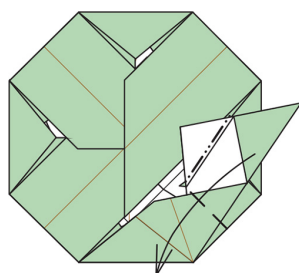
20. Fold the four corners underneath.



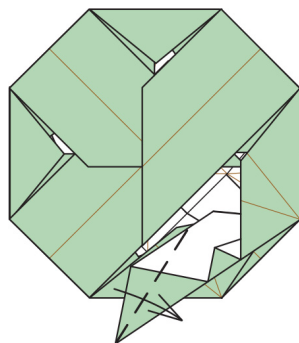
21. Turn the model over.



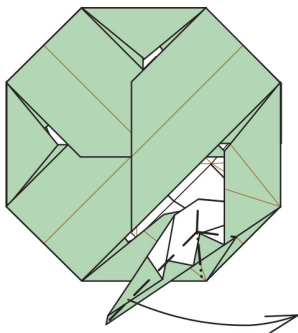
22. Swing a flap to the right and flatten, pulling out a layer underneath.



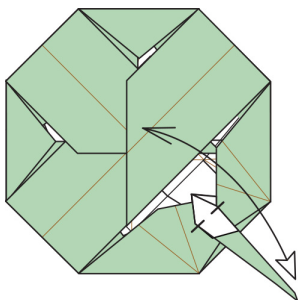
23. Squash-fold downward, again pulling out a layer underneath.



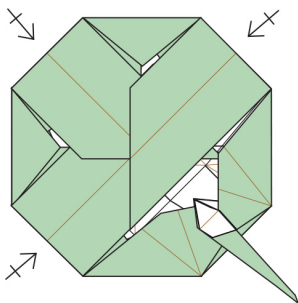
24. Valley fold to narrow the point.



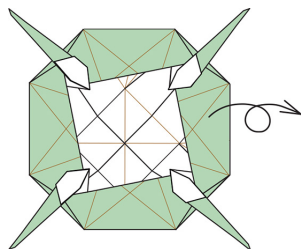
25. Rabbit-ear.



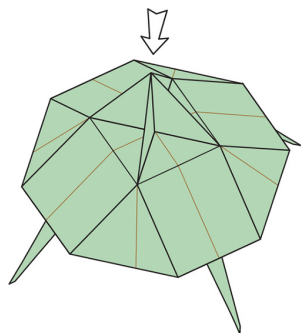
26. Fold toward the center and unfold.



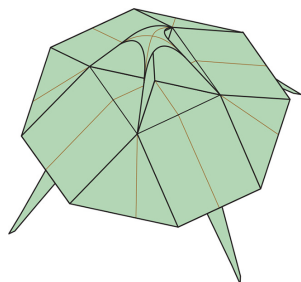
27. Repeat steps 22–26 on the three remaining flaps.



28. Turn the model over.



29. Push in the top of the pyramid to make it dome-like.

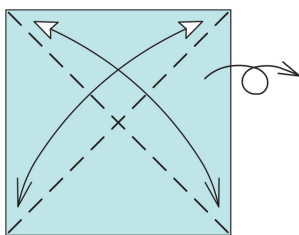
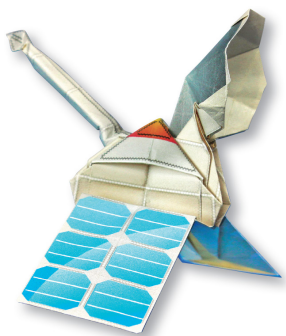


30. The Flying Saucer.

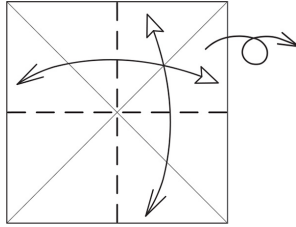
SPACE PROBE

Humans have long sent probes to the distant reaches of the cosmos to learn about our solar system and beyond. A typical space probe has a boom and dish for instruments to gather information and send and receive data transmissions to and from Earth. An array of solar panels provides power.

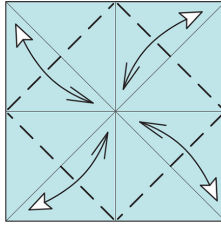
For best results, use a 10" square or larger. Paper that size was too large to include in this kit, but you may download the pattern seen in the photo and print it as large as you like. To download, type this URL into an Internetconnected web browser: www.tuttlepublishing.com/air-and-space-origami-kit-downloadable-content. Begin solar panel side up with the dish to the upper left.



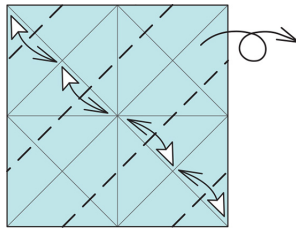
1. Fold and unfold the diagonals. Turn the model over.



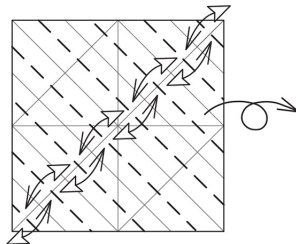
2. Fold and unfold on the square axes. Turn the model over.



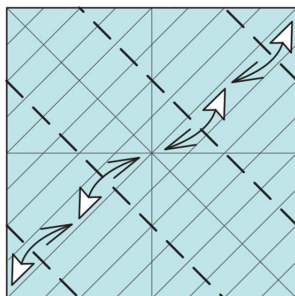
3. Fold to the center and unfold.



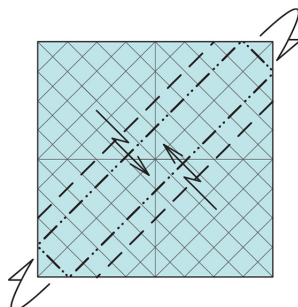
4. Fold and unfold the diagonal to divide into quarters. Turn the model over.



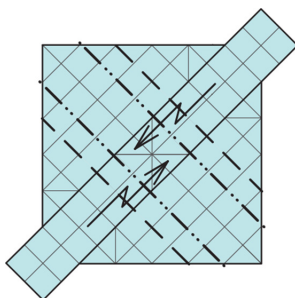
5. Fold and unfold the diagonal to divide into eighths. Turn the model over.



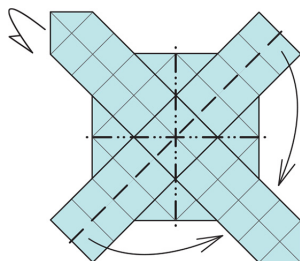
6. Repeat steps 4–5 on the perpendicular axis.



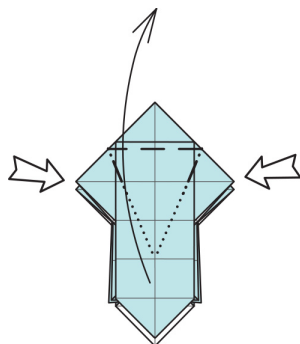
7. Pleat along the diagonal. Take care to leave a gap where the pleats meet. Tuck two corners under.



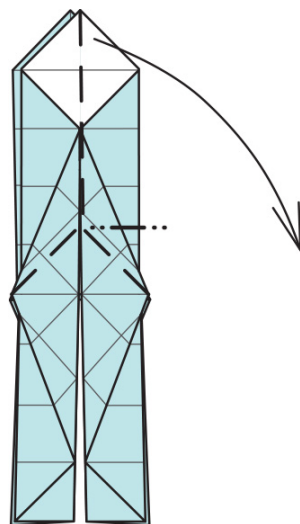
8. Pleat on the opposite axis. Again be careful to leave a gap where the pleats meet.



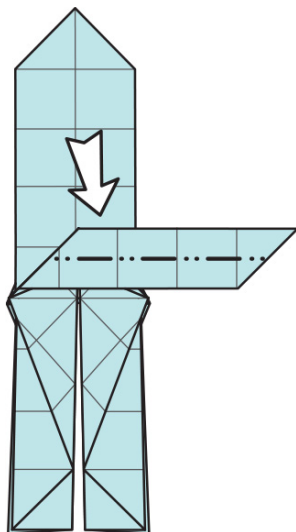
9. Fold in half while reverse folding the sides. Rotate the model.



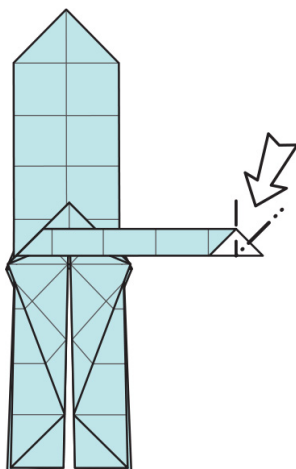
10. Petal fold. Repeat behind.



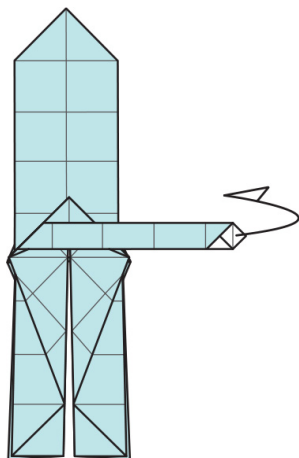
11. Rabbit ear.



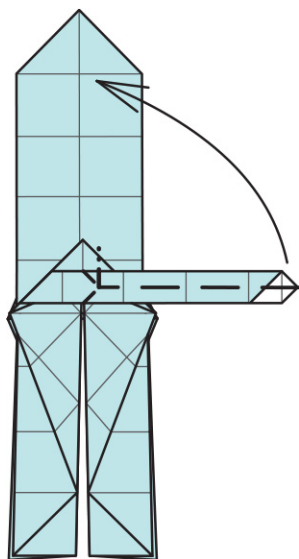
12. Sink to narrow the flap.



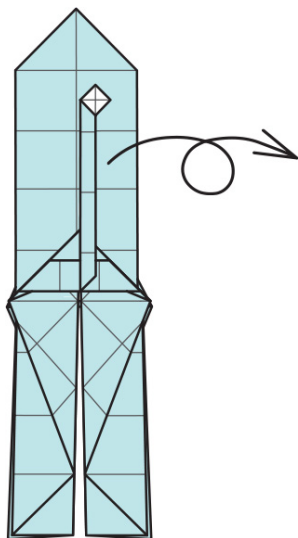
13. Squash fold.



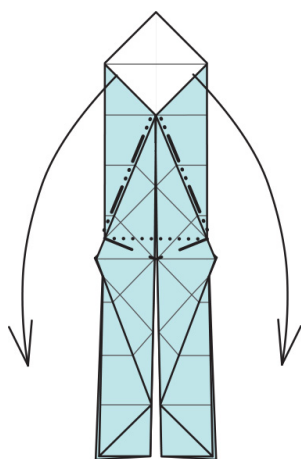
14. Swing the diamond-shaped flap to the back.



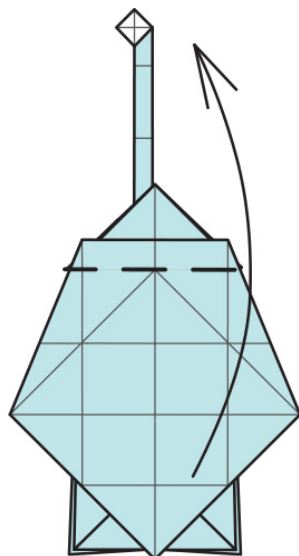
15. Rabbit ear.



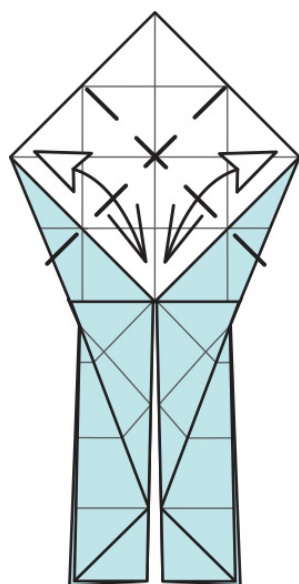
16. Turn the model over.



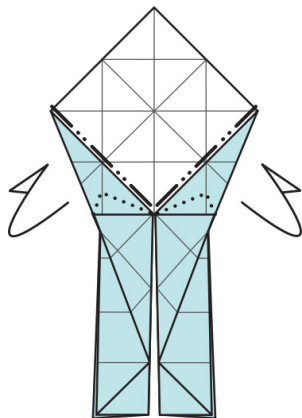
17. Spread and flatten.



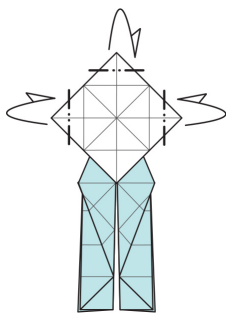
18. Fold the flap up.



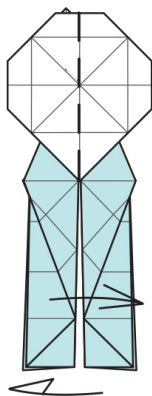
19. Fold and unfold.



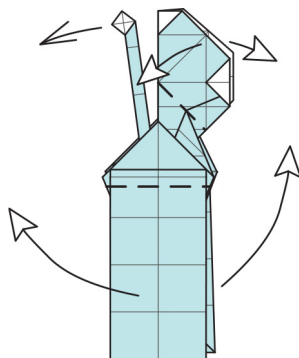
20. Slide the loose paper behind the flap.



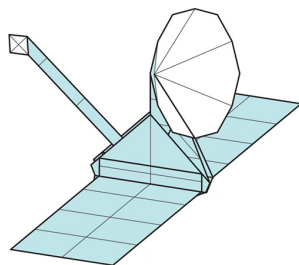
21. Fold the three corners behind.



22. Fold a near flap to the right, and the rear flap to the left.



23. Swing out the boom. Open up the radio dish. Spread the solar panels.

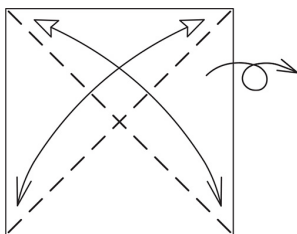


24. The Space Probe.

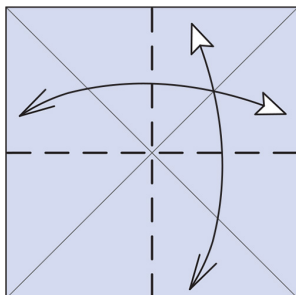
ASTRONAUT

Humans require special space suits to survive in the cold vacuum of outer space. In such a suit an astronaut can work, explore, move between spaceships, and walk on the surface of other planets.

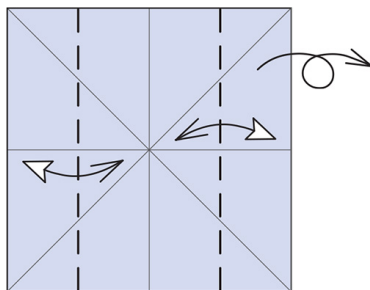
Use a 6" square or larger. Begin white side up, with the helmet oriented toward the top on the patterned side.



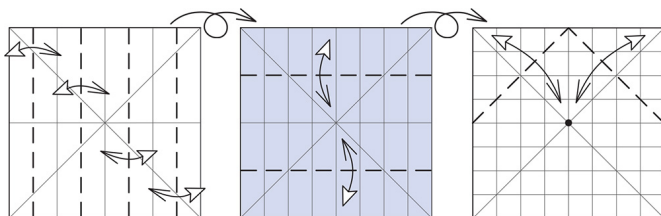
1. Fold and unfold on the diagonals. Turn the model over.



2. Fold and unfold on the square axes.



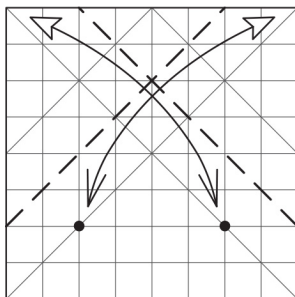
3. Fold two edges to the center and unfold. Turn the model over.



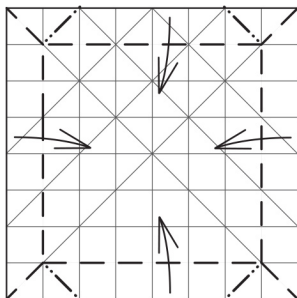
4. Fold and unfold to divide the paper into eighths. Turn the model over.

5. Repeat steps 3–4 on the perpendicular axis. Turn over.

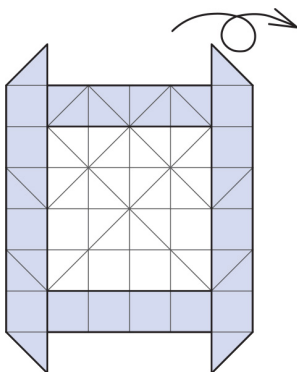
6. Fold two corners to the center and unfold.



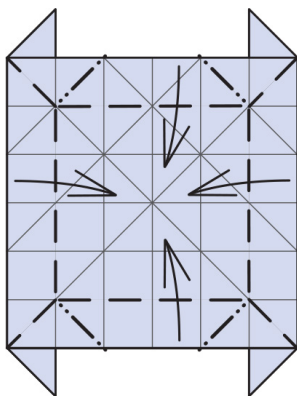
7. Fold and unfold.



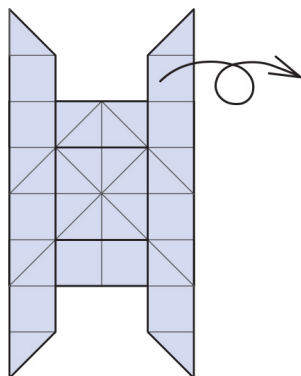
8. Fold the edges in and flatten the flaps at the corners.



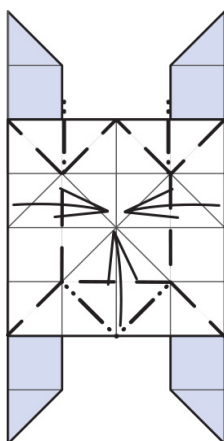
9. Turn the model over.



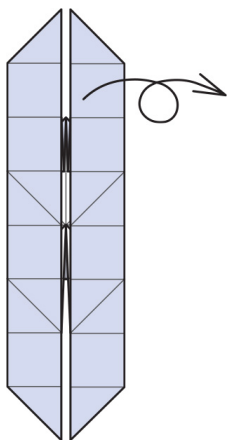
10. Fold the edges in and collapse the corners again.



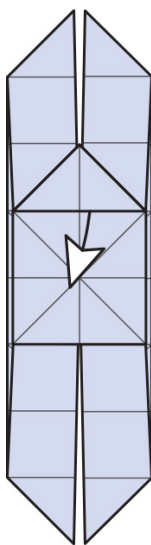
11. Turn the model over.



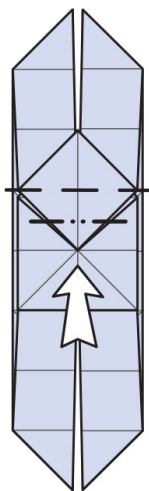
12. Collapse a third time. Note that the top edge is different this time.



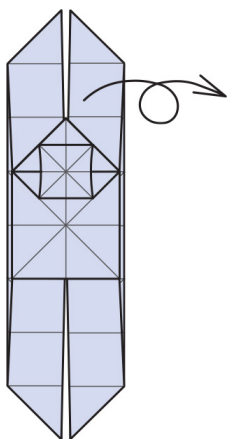
13. Turn the model over.



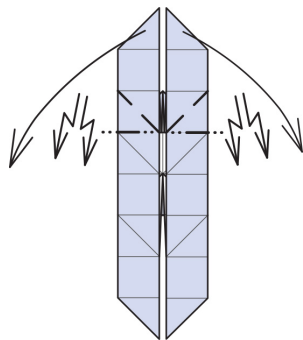
14. Pull out a hidden flap.



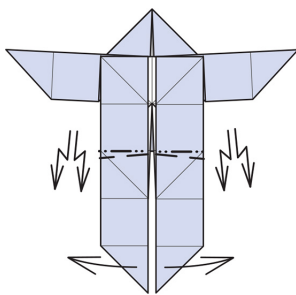
15. Spread-squash fold.



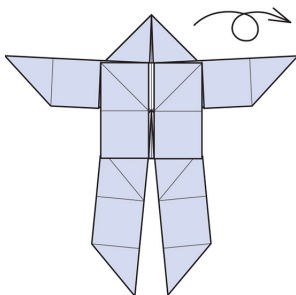
16. Turn the model over.



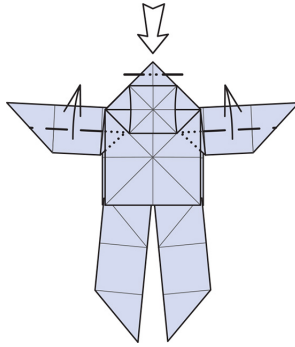
17. Crimp to swing out the two upper flaps.



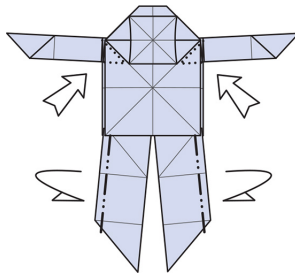
18. Crimp and spread the two lower flaps slightly.



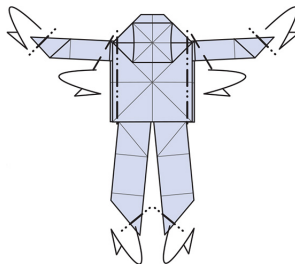
19. Turn the model over.



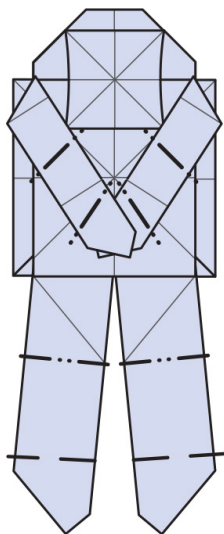
20. Sink the top of the head. Reverse folds to thin the arms.



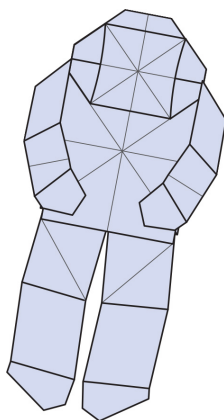
21. Reverse fold the hidden flaps at the shoulders. Mountain fold to thin the legs.



22. Reverse fold the tips of the arms and legs. Mountain fold to thin the torso. Fold the arms over.



23. Crease at the elbows, wrists, knees and ankles. Pose the model.

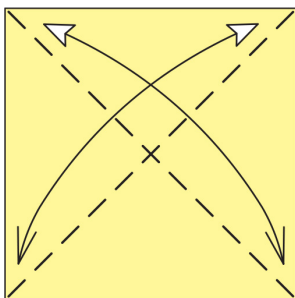


24. The Astronaut.

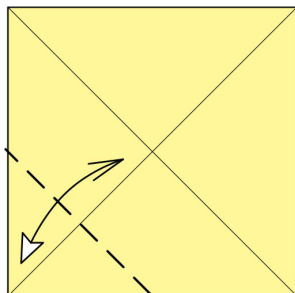
SPACE SHUTTLE

The Space Shuttle was the first reusable spacecraft that could take off vertically, propelled by external rockets, and land like an airplane. The shuttle enjoyed many years of service performing scientific missions, deploying satellites and transporting astronauts to space.

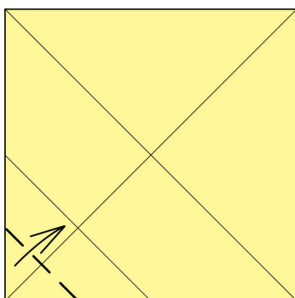
Use a 6" square or larger. Begin patterned side up with the nose in the bottom left corner.



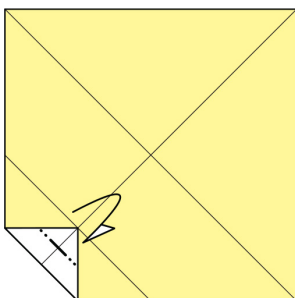
1. Fold and unfold on the diagonals.



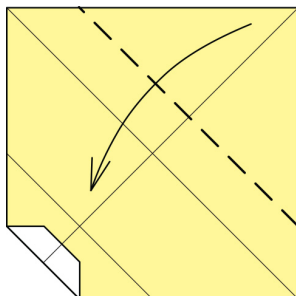
2. Fold a corner to the center and unfold.



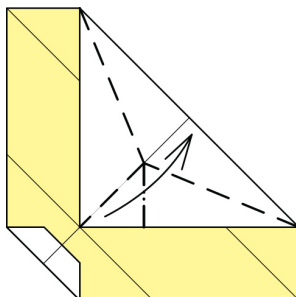
3. Fold a corner to the landmark.



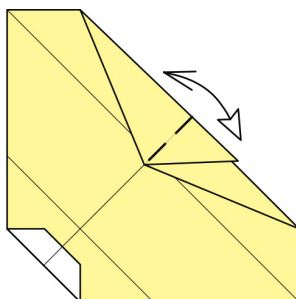
4. Tuck the tip underneath.



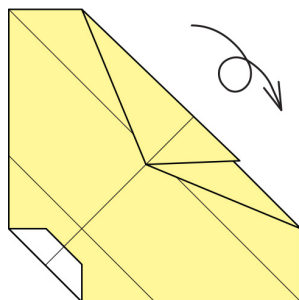
5. Fold the opposite corner to the landmark.



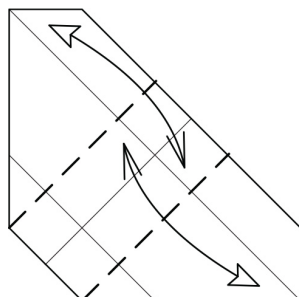
6. Rabbit ear.



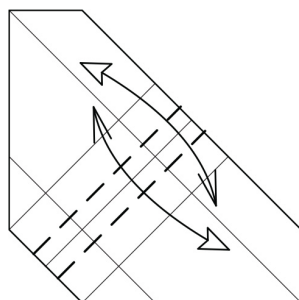
7. Swing the flap back and forth and crease.



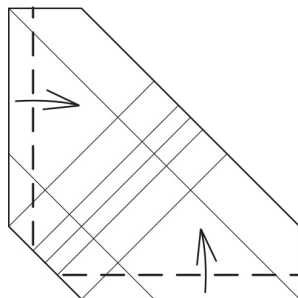
8. Turn the model over.



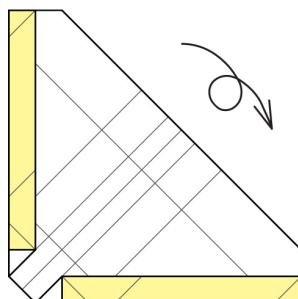
9. Fold and unfold.



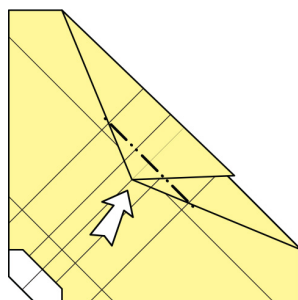
10. Fold and unfold, dividing the middle region into thirds.



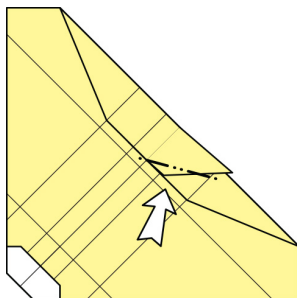
11. Fold two edges in.



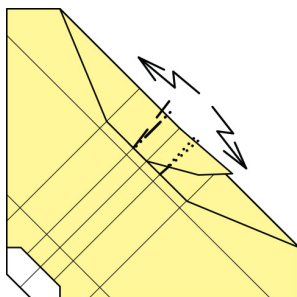
12. Turn the model over.



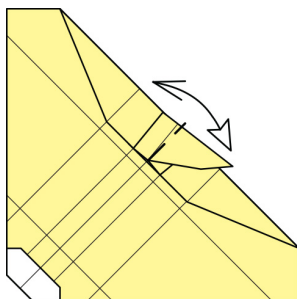
13. Sink.



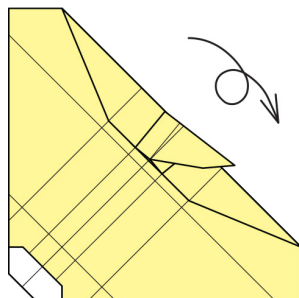
14. Closed sink.



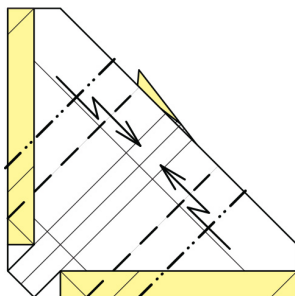
15. Pleat on the sides so the tail fin slides back.



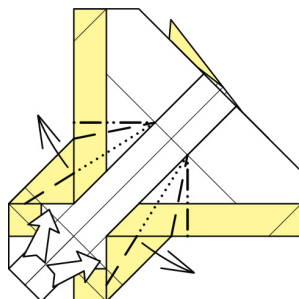
16. Swing the flap back and forth and crease.



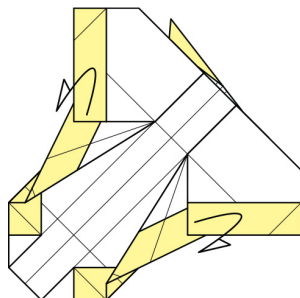
17. Turn the model over.



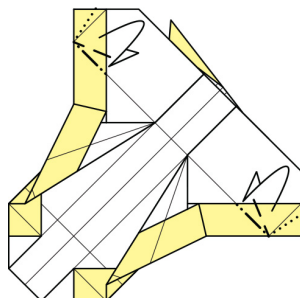
18. Pleats.



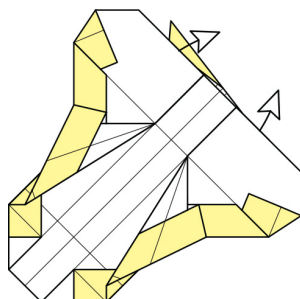
19. Swivel folds.



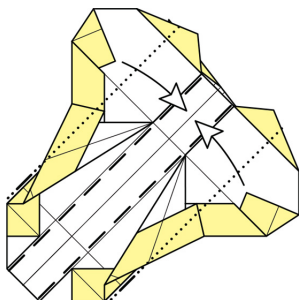
20. Rearrange the layers to lock the flaps together.



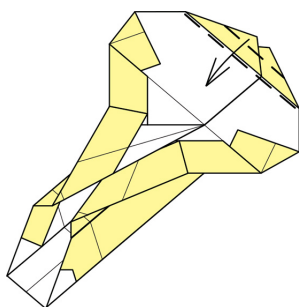
21. Swivel folds.



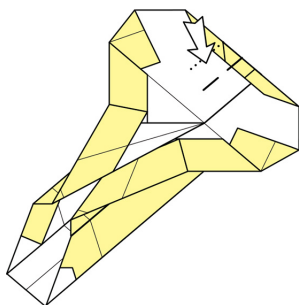
22. Pull out some layers.



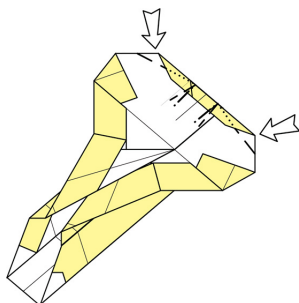
23. Pull up the two wings to make them overlap. The model becomes 3-D.



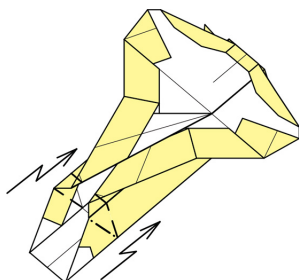
24. Fold the layers at the tail over twice to lock them together.



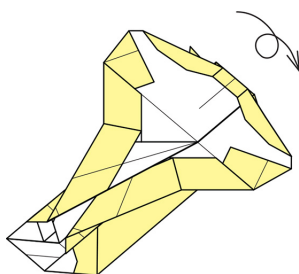
25. Pinch and unfold to make the lock more secure.



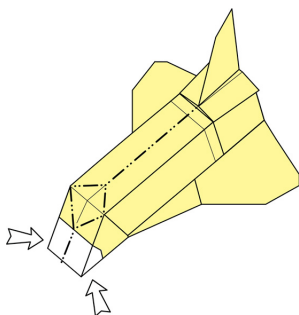
26. Swivel folds to shape the backs of the wings.



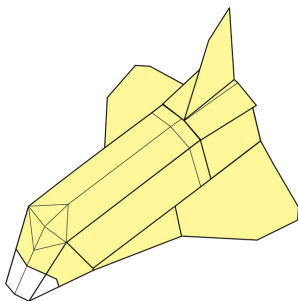
27. Crimp to form the nose.



28. Turn the model over.



29. Sculpt the model.



30. The Space Shuttle.

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